

MODEL AIRPLANE NEWS

11th Year of Publication

JULY, 1939

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The Bell XP-39 Pursuit

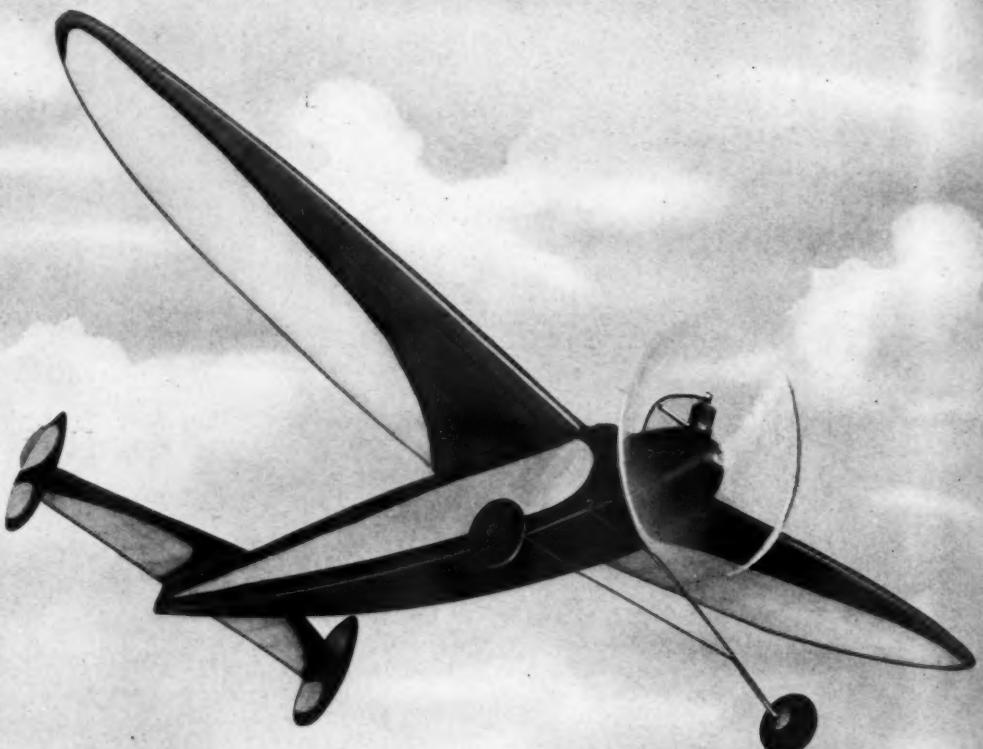
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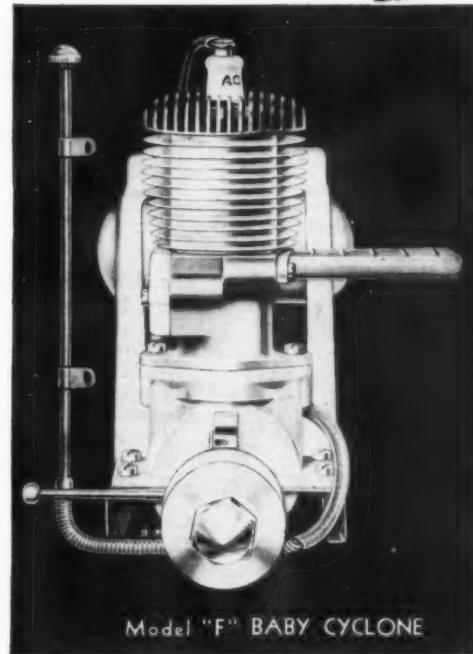
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Model AIRPLANE News

11th YEAR OF PUBLICATION

VOL. XXI

No. 1

Edited by Charles Hampson Grant

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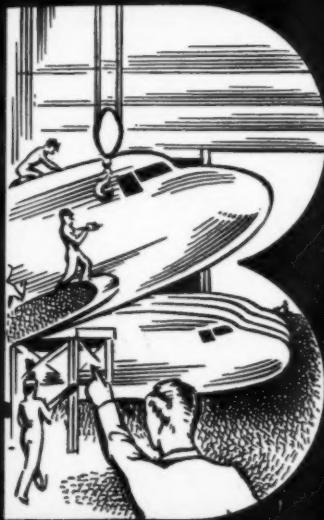
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BELL PURSUIT U.S. ARMY P-39

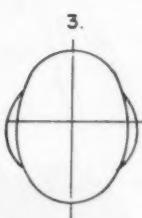
1000 h. p. Allison Engine mounted amidship

AT ROOT

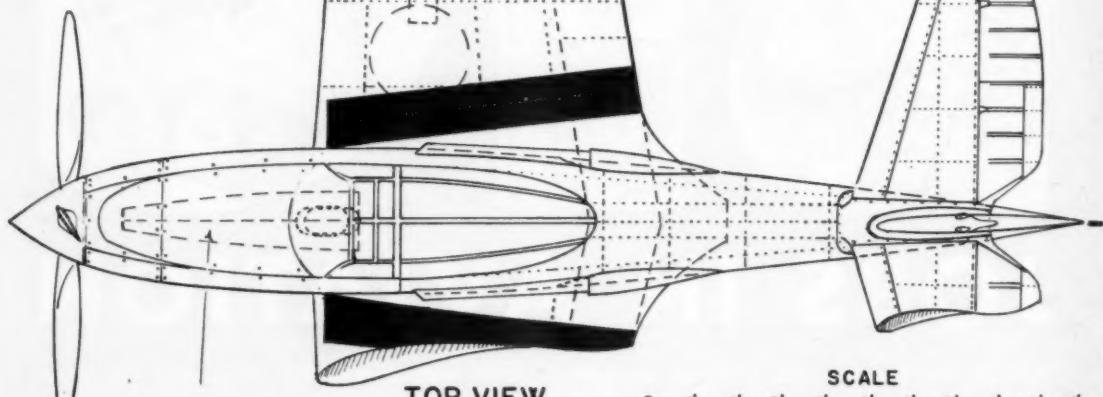


AT TIP

WING SECTIONS



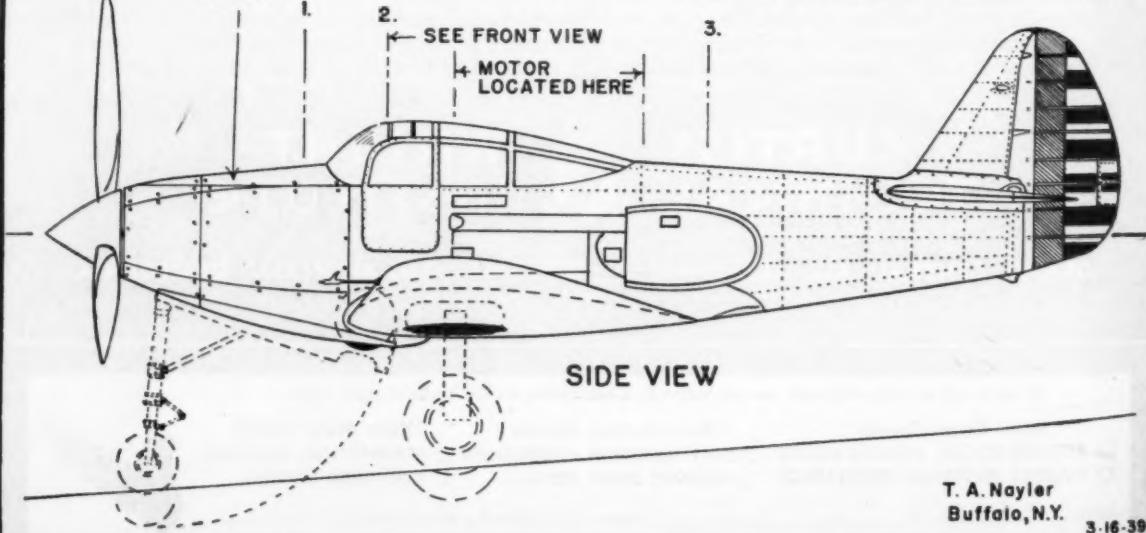
FUSELAGE SECTIONS



TOP VIEW

SCALE
0 1' 2' 3' 4' 5' 6' 7' 8' 9' 10'

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SIDE VIEW

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3-16-39

The Bell XP-39 Pursuit Plane

Uncle Sam's New Mystery Plane

By DOUGLAS J. INGELS

FIFTEEN thousand aviation conscious American citizens saw the fastest, newest, most radically designed pursuit ship Uncle Sam has to date whizzed across the field and zoomed into the sky on its initial test flight, and they didn't know it!

It was Army Day at Wright Field, Air Corps Materiel Division and keystone of President Roosevelt's \$300,000 air expansion program. The crowd had come to see what it could see about America's newest fighting planes, but only a few spotted the plane which had been a closely guarded secret in the engineering laboratories for many weeks. That ship was Lawrence Bell's prize package, the XP-39, the army's latest fighting plane, product of the Bell Aircraft Co. in Buffalo, New York.

Surprised were newsmen and even many of those at the Field at the "daring revelation" exposed when the plane was tested before the Army Day crowd. More so were they surprised when announcement came from Washington that Uncle Sam had ordered many more of the fighters to bolster his pursuit units. And this, without the formality of bids and other routine, usually a long procedure at the Procurement Division here.

But the plane itself makes the real news. It is a trim little fighting plane incorporating revolutionary design features, which permit a high degree of armament.

Designated as the P-39 it is one of the swiftest and fiercest pursuit planes ever constructed. Hard to get are indications of its approximate speed. No Air Corps officer will talk on this "vital" subject. However, according to sources of unquestioned authority, the ship is capable of speeds in excess of 400 miles per hour.

Here is Uncle Sam's answer to those who claim that foreign powers have superior aircraft. With such a speed and good maneuverability, another feature aided by its design, the ship is considered capable of outflanking any plane yet known.

At the controls in its initial test flight on Army Day was Bell Test pilot, Earl Carlson. The following day another Bell test pilot, Henry Taylor, took the ship aloft and reported that its performance more than lived up to the army's expectations.

Reports after the two test flights indicated that the tiny ship was the first military airplane in the world capable of sustained flight at between 400 and 500 miles per hour. This, discounting, of course, the twin-engined Lockheed XP-38, which Lieut. Ben Kelsey raced across the continent at speeds in excess of 420 m.p.h. in spurts.

What the Lockheed might do remains to be seen when the new ship comes to the



Boasting of a three wheel landing gear, it flies at more than 400 m.p.h.

Materiel Division for testing. Officers and engineers here saw only one glimpse of the ship, which crashed when Kelsey attempted a landing in New York after his record. A new plane is now under construction and should be brought to the field anytime. Engineers and Air Corps officials look forward to its performance figures.

Both planes, the new Bell and the XP-38 Lockheed, are indicative of a new trend for speed. Faster, deadlier, planes are already "on paper." Proof that Uncle Sam isn't bluffing.

Most radical factor of the New Bell fighter's design is the placement of the motor in the center of the fuselage. Because of this the propeller is driven by a long-section shaft which leaves room in the fore part of the ship for its guns and other armament features.

It is armed, according to authoritative sources, with from four to six machine guns and an electrically-fired 37 millimeter cannon, all of which shoot projectiles through the whirling propeller blades.

Although the modern principle of arming warplanes with cannon dates back to wartime designs, the Bell Aircraft Company is the first known to incorporate this in their fighting aircraft. The "Airacuda" known as the XFM-1 to the Air Corps, also is equipped with cannon. Its guns are mounted on either side of the fuselage in front of the pusher-type propellers. They are the same size as those that are on the new pursuit.

The pilot is enclosed in a transparent canopy, which gives exceptional vision characteristics in all directions. The door resembles that of an automobile. This does away with the sliding section on conventional types and provides quicker egress in case the plane is disabled in combat.

This, little fighter may be dubbed the "mosquito" since it appears to be so small and hangs so close to the ground. It is a low-wing, all-metal monoplane with graceful lines. The "flow" of the fuselage is interrupted only by the curving glass plug which covers the pilot's cockpit.

Not long ago Orville Wright observed that the "modern engineers of the aeronautical world are devoting their research more to the design. They are seeking to

find new secrets of streamlining and adhering to the principles of air flow." Evidence of this can be plainly seen in the Bell fighter and the XP-38.

Like the Lockheed XP-38 and the "Airacuda" the new chaser plane is powered with the Allison cylinder-in-line motor. This 1250 horsepower motor is constructed on long, slender lines to permit an acme in streamlining.

The engine is supercharged to carry this fighter to the exceptionally high altitudes where air fighting now will take place. In order that the pilot may be able to fly and fight at maximum efficiency in light clothing, his cockpit is heated and he is provided with oxygen, supplied through a small tube from a tank carried in the plane.

Being placed in the middle of the ship the motor aids, rather than distracts from the ship's maneuverability. This can be clearly pointed out in referring to the action of a pendulum which moves much easier around the fulcrum when its weight is shifted near the center point. Such theory, gives the Bell fighter greater maneuverability than any of its predecessors.

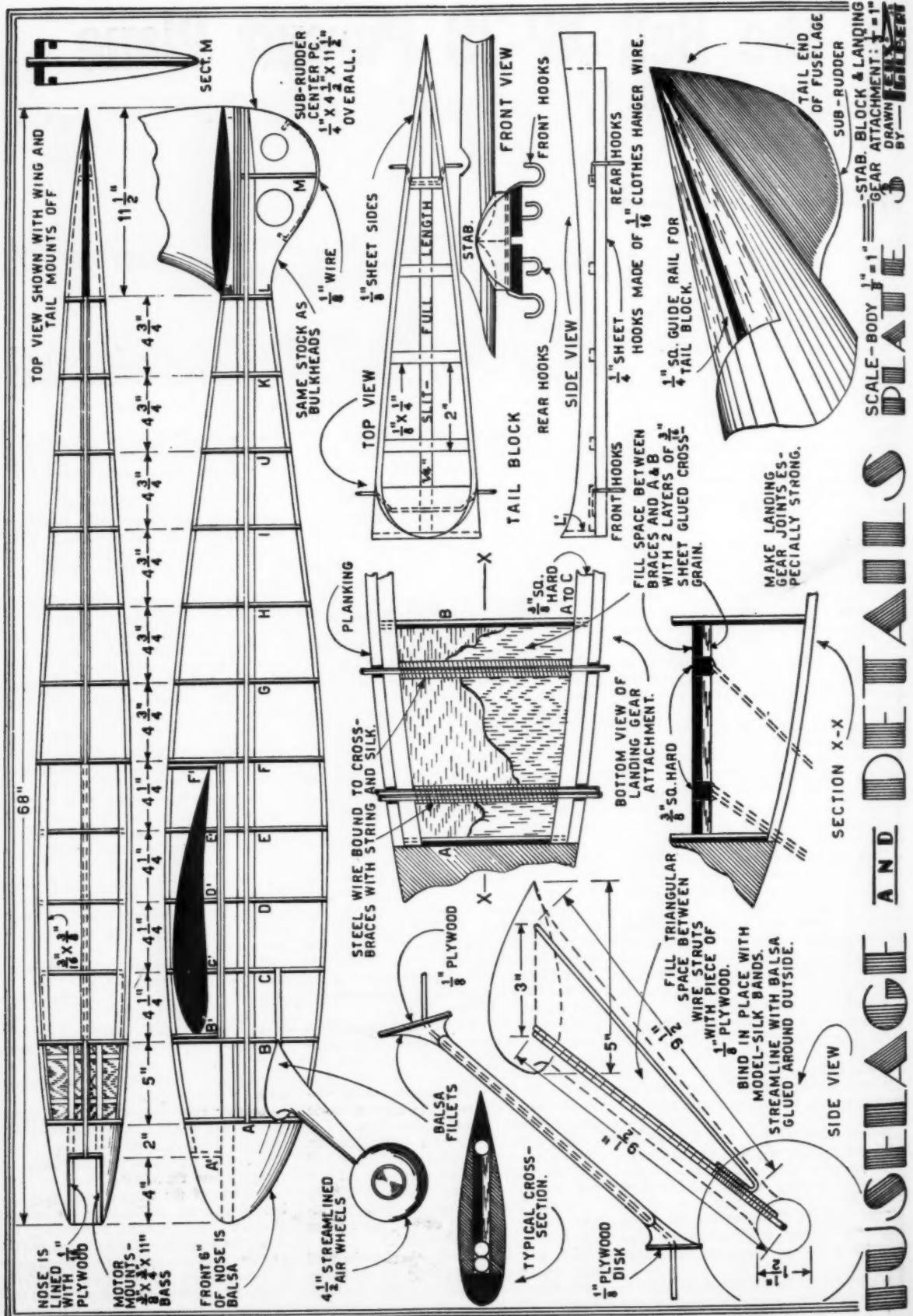
In length and height the XP-39 is smaller than any of Uncle Sam's other pursuit planes. Its gross weight is 6000 pounds which makes it one of the world's lightest warbirds.

Part of its secret of speed lies in its construction. The rivets which are used are flush with the skin eliminating the drag of protruding rivet heads. This is accomplished by the use of Alclad coating. After the rivets are countersunk, the skin is coated with a layer of Alclad which gives the fuselage and wings almost perfect smoothness.

Another new feature is that it incorporates the tricycle landing gear with a nose wheel that disappears into the fuselage. The landing wheels beneath the wings fold sideways into the wings.

The use of the tricycle landing gear is becoming more predominant on military aircraft. Its outstanding advantage is that it always keeps the ship in flying position and thus aids greatly in cutting down on the necessary room for take-offs. This is an important feature in wartime when land-

(Continued on page 28)



Building the DOLPHIN

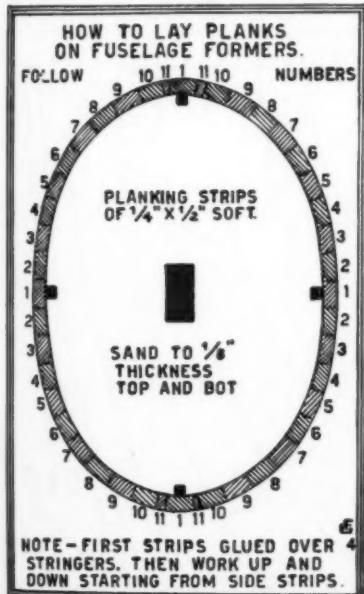
How to Build a Super Streamline High Performance Soaring Gas Model—Part No. 2

By THRACY PETRIDES and FELIX GILBERT

THE FIRST installment in last month's MODEL AIRPLANE NEWS explained the construction of the wing and tail surfaces. The building of the rest of the "Dolfin" will be completed in this issue.

The fuselage for this ship is not too easy to make and requires a great deal of accuracy, however the system used here in building the body will insure good alignment if a reasonable amount of care is taken.

The construction of the "keel" is shown in the left middle of Plate 5. It is made by laminating strips of $1/4" \times 1"$ medium strips to form a piece $1/2" \times 1"$. When this is completed the bulkhead positions are marked off to correspond with the various distances shown on the drawing (Plate 3).



The length of the keel is exactly 62".

Note that it tapers at the extreme tail end.

The bulkhead stock is made by laminating sheets of $1/8"$ balsa with the grain, at right angles. The dimensions for the blanks for each bulkhead are the maximum length and the maximum width. Make a rectangular plywood (balsa) piece using these measurements. When all the blanks are made, transfer the outline of the proper bulkhead on its corresponding blank. Note that only half of each bulkhead is shown, and must be reproduced on the other half of the blank to give the elliptical cross-section. The bulkheads are now cut out, and glued to their respective positions on the keel, checking with a triangle to see that all joint faces are perpendicular. There are only four stringers in all. They are of $3/16"$ square gas model stock, and are then put in place. Now the $3/8"$ square hard landing gear braces are cemented into their respective notches, and the two $3/8" \times 3"4" \times 11"$ bass motor mounts may also be glued in at this time. Make these joints exceptionally strong.

The various landing gear struts are easily bent on a vise from $1/8"$ steel wire. All the dimensions for these are shown on the lower left corner of Plate 3. On the top view of the body it will be seen that between bulkheads A and B there are two $3/8"$ square hard cross braces. These are firmly cemented to the two longitudinal landing



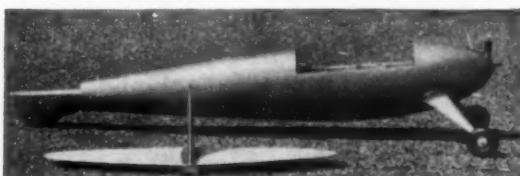
The nose of the fuselage showing the motor mount

gear braces at the positions shown on the plans. When the joints are dry, the three-wire landing gear struts are bound securely to the bottom of the braces with ribbon $1/4"$ wide, cut from gas model silk. It is advisable to first bind with string and then reinforce with ribbon as was done on the original model. A good cement skin will further reinforce these joints. Note that the two front landing gear struts are first tied to each other, and then to the front brace. Fill in the space between the bulkheads A and B and the braces with two layers of $3/16"$ sheet balsa laminated cross-grain as shown in the bottom middle of Plate 3. The bottom left of the same plate gives full details on streamlining the landing gear struts. When finished, a practically indestructible landing gear will be disguised under a beautifully streamlined filleted covering.

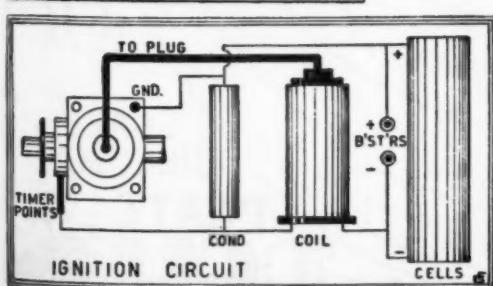
The coil and batteries may be placed between bulkheads B and D, or they may be placed between A and B, but they must then be made accessible by means of a door not shown on the plans. This latter course is recommended because the wiring should be as short as possible. It is advisable to build both the wing and the tail mounts in place on the fuselage so that they will accurately follow the contour of the body. Of course the wing mount cannot be completed without the wing frame in position. When glue-

ing the wing and tail in place on the mounts they should be checked so as to have two degrees positive angle in the wing and zero degrees in the tail.

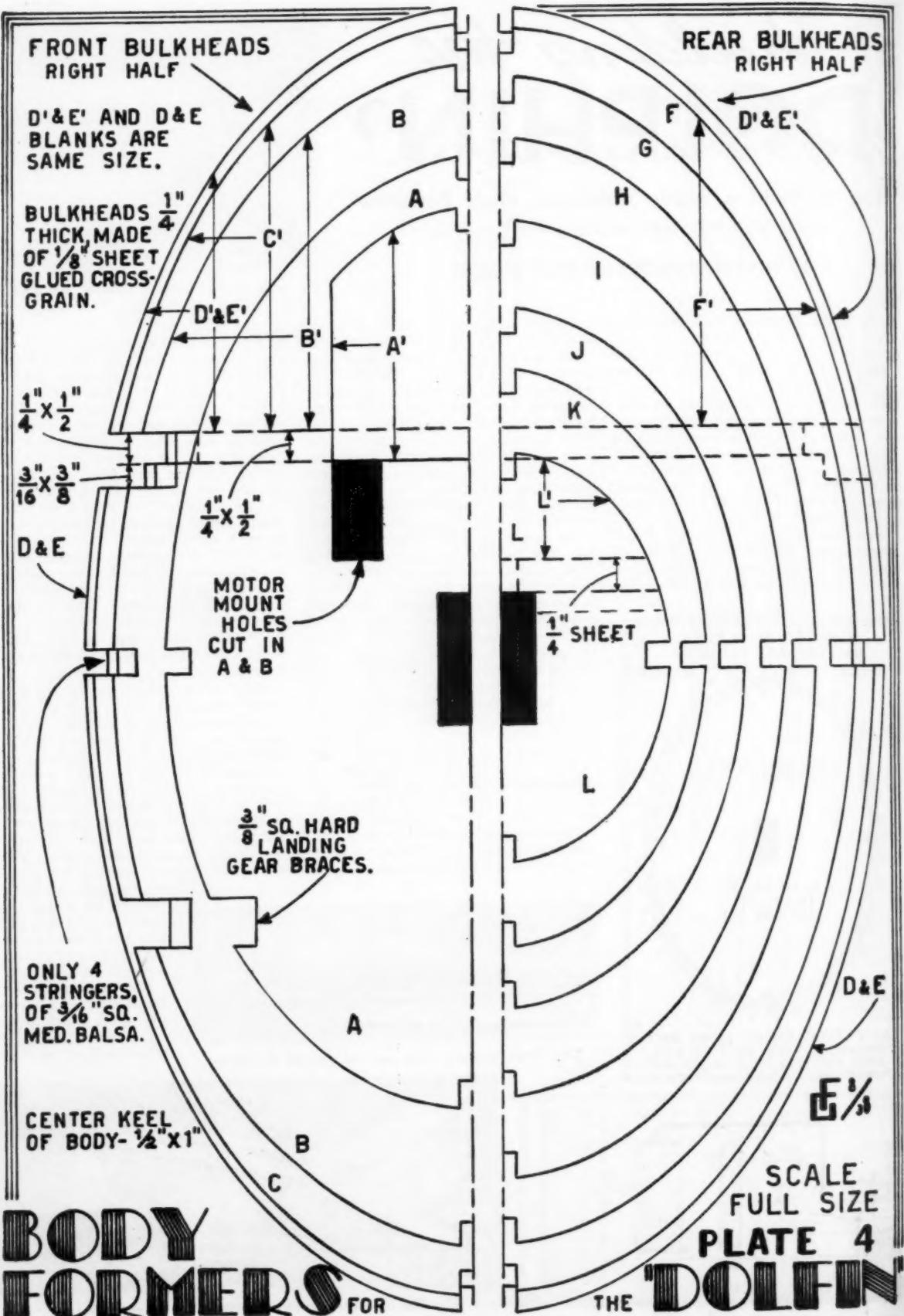
Note that bulkheads C, D and E are in two pieces, the lower half which forms part of the "belly" (Continued on page 38)

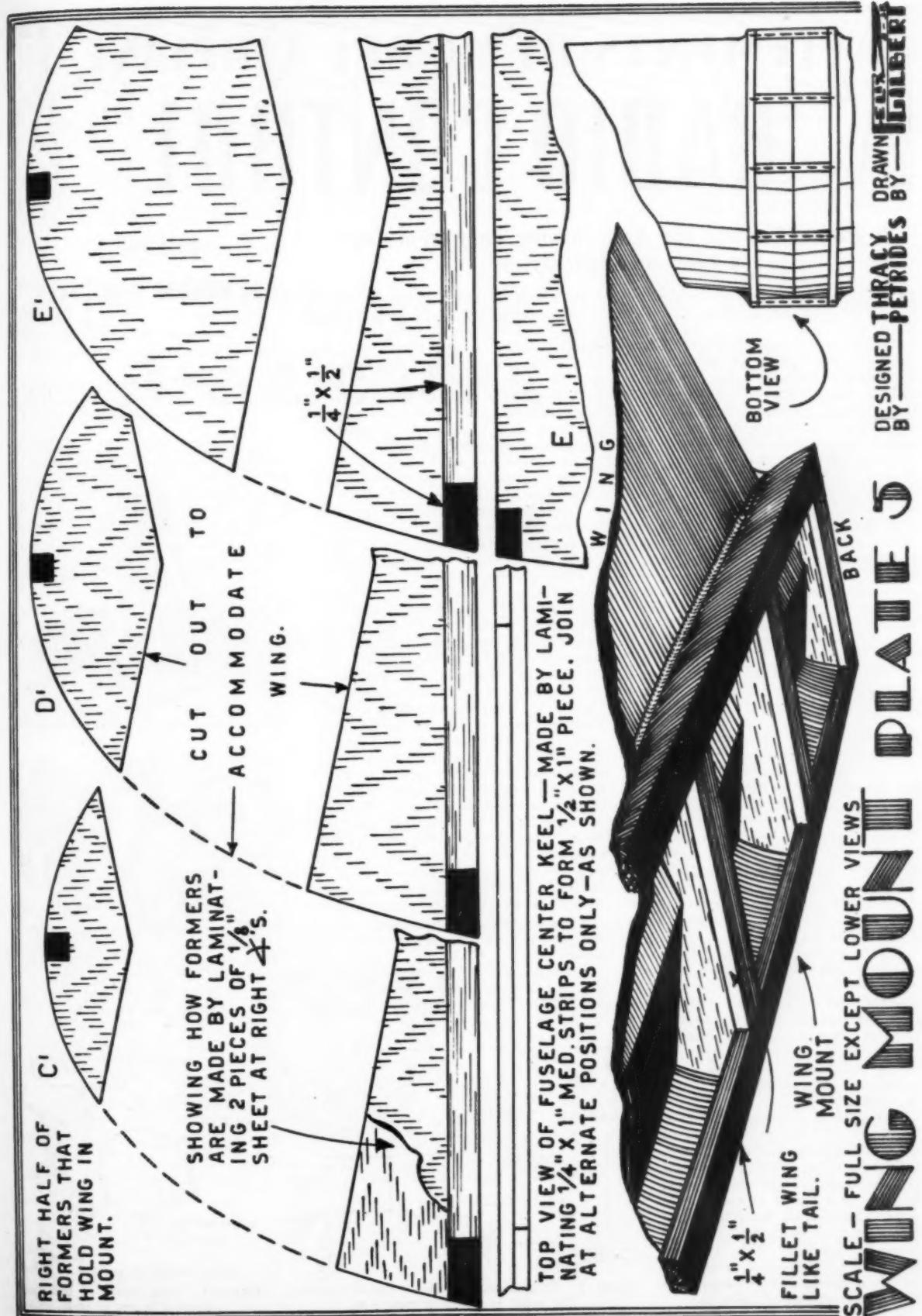


This shows how the wing and tail may be disassembled



The model, ready to fly, shows grace in every line





ELEMENTS OF MODEL AIRPLANE RADIO CONTROL

A Radio Control for Your Motor That Will Give a High and Low Speed

AS WE promised in the last article, (Part II), we present here a scheme for motor speed control.

Its use requires the operation of a single channel transmitter only, so that for control of speed and direction a dual channel job such as shown in Part II will be required. It would be possible to control both rudder and motor over a single channel by utilizing a sequence switch at the receiver which would connect first rudder then motor in a fixed sequence. This would be very inflexible, however, and the real benefit and pleasure of this speed control can only come when the dual-channel system is in use.

It has always seemed to the writer that in addition to directional control, such as achieved by rudder or elevator movements, or both, it would be highly desirable to have *motor speed control* as well. This would call for some system by which the motor could be made to operate on at least two speeds, high and low. The low speed would not necessarily be idling, but slow enough so that the model would have insufficient power to climb or fly level.

One can well imagine the thrill of having such motor control, which in conjunction with rudder control (and a reasonable amount of luck), would enable one to practice landings just as though a real plane were being flown. In operating, the motor control would allow the operator to cause the ship to climb or glide providing proper adjustment of the elevator had been made. You could even "jazz the throttle" as the ship was coming in. In our opinion, motor speed control together with directional control would offer about the last word in thrills and realism.

The system worked out for this purpose is quite simple and requires no additional equipment beyond the ordinary receiver equipped with a single pole double throw relay, such as the Sigma 3A used in these experiments. A little work is needed upon the motor, but this is within the province of practically every builder, as only ordinary hand tools are needed.

The speed of a two cycle motor is best controlled by manipulation of spark adjustment, so the problem is simply one of changing the spark setting electrically. This could, of course, be done by a system of gears and a reversible motor, the latter hooked up in some such circuit as that of Fig. 1 D shown in Article I. This, while enabling full range control, would also introduce weight complications, so a simpler scheme was settled upon.

The circuit is shown in Fig. 1, and it will be seen that two sets of ignition points are used. These points are connected in the circuit at will by proper operation of the relay. The ordinary points as furnished with the motor are used for the high speed position, as they are engineered for best operation at full power. What we must do is to provide an auxiliary set of points to run the motor at a retarded speed.

This system has been tried only on a Brown Jr. Model B engine; the exact same system, of course, is applicable to all Brown Jr. types. The application of this principle is undoubtedly possible on the majority of gas engines on the market and will simply take a bit of headwork and smart designing by the prospective builder.

The auxiliary points, of course, are timed to fire the charge in a retarded position, relative to the normal or high speed points. The very first step in the process is to run your motor and find out about how far the spark may be retarded and still have reliable slow speed operation. The greatest drawback to slow speed operation is the mixture, which of course is adjusted for full speed work. The ideal would be to have the motor just tick over when on the auxiliary contacts, but this is quite impossible due to the simple mixing valves used. The best that can be done is to cut the speed in half. A model loaded up with radio apparatus certainly cannot climb very well on half throttle, so this serves our purpose very well. Under certain conditions a wider range of speed is possible and naturally the widest possible change is what we wish, provided the motor will run reliably on low speed and will pick up again when the relay moves.

Use of an auxiliary carburetor jet or air valve would enable better results and this will doubtless come later, but meantime, we

Part No. 3

By HOWARD G. McENTEE

must do the best we can with the necessarily simple and lightweight mixing valves at hand.

From all this discussion it will be appreciated that the preliminary testing is highly
(Continued on page 28)

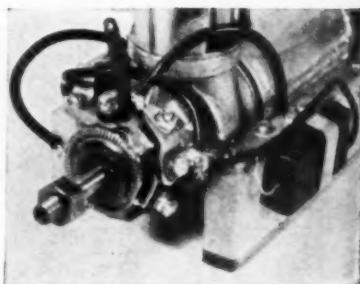
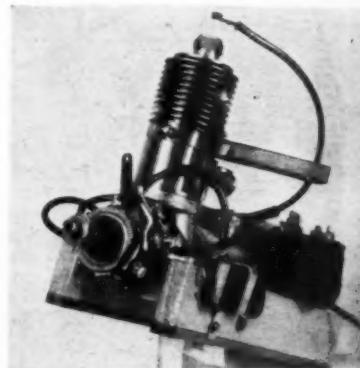


Figure 2. Motor speed control fitted to a Brown, Jr., Model B

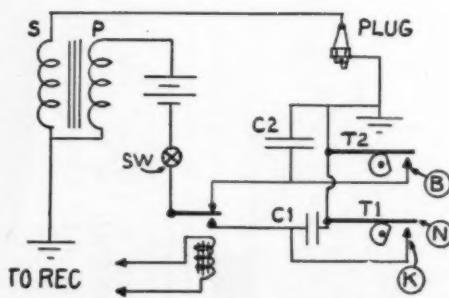


Figure 1. Connections for motor speed control.
The relay is a Sigma type 3-A

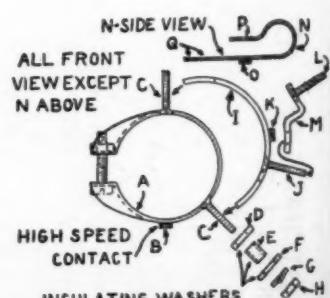


Figure 3. This sketch of the speed control is not to scale



Buses at headquarters, ready to take model fans to the field



Typical view of model builders viewing
scenery after contest



Frank Zaic waits to have his gas buggy checked. Dick Everett holds the model

The “Nationals” Are Coming!

THREE comes a time in the lives of all good aeromodelers when they begin figuring the gas mileage of the family flivver, the state of disrepair of their contest ships and the distance to Detroit from the old home town.

Right you are! It's the Nationals they're thinking about, talking about, even dreaming about.

Now once again the warm spring breezes waft up discussions of the 12th National Model Aircraft Contest. Certainly you know the dates—July 6 through 9, and that the Exchange Club Council of Detroit will sponsor the fray. Pardon us if we don't discuss events and rules here—undoubtedly you've already sent a stamped, addressed envelope to Washington and right now are waiting for the mailman to bring your entry blank and official handbook of rules.

We are not gathered here today, chums, to discuss rules and events—no sir, we're here to reminisce.

Why, say, son, we can remember the "good ole days" when a National Meet was a modest little affair with a hundred or so contestants sweating over solid-stick indoor endurance craft and outdoor

BY AL LEWIS

fuselage-type rubber crates. We can even remember compressed air motors—and that is a clue to our dotage!

But, no foolin', did you ever take time out to consider the phenomenal growth of our biggest, best and most popular modelplane meet—the Nationals? Time was when a couple of model shops could sponsor a Nationals—but no more. Why, last year's brawl, the largest ever held—required more than 100 persons to direct the activities on the field of battle alone. And we'll never know how many more were slaving behind the sidelines.

Yessir, more than 100 folks all laboring for the same cause—a smooth running Nationals! It was a swell affair, too—although the 1939 competition promises to make it look like a mere sectional session!

Bigger 'n' better than ever! Things certainly look fine for the '39 contest. With genial Art Vhay general manager and jovial Irwin S. (Polkchops) Polk, the vice-president in charge of finessing



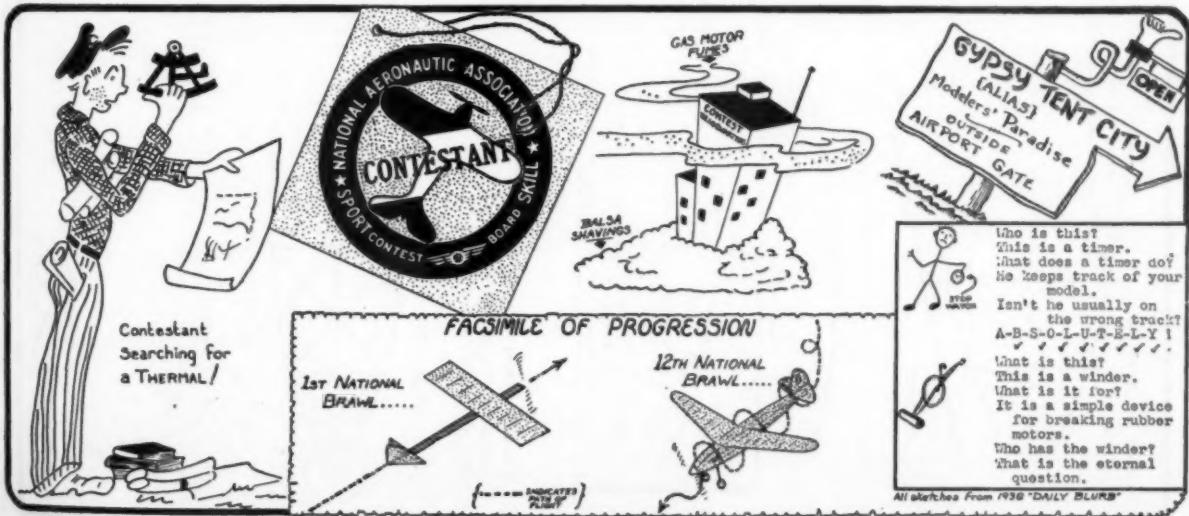
Puzzle: Find the automobile. All ready for a day at the flying field

trophies, your trek to Detroit will be to the best meet of all time.

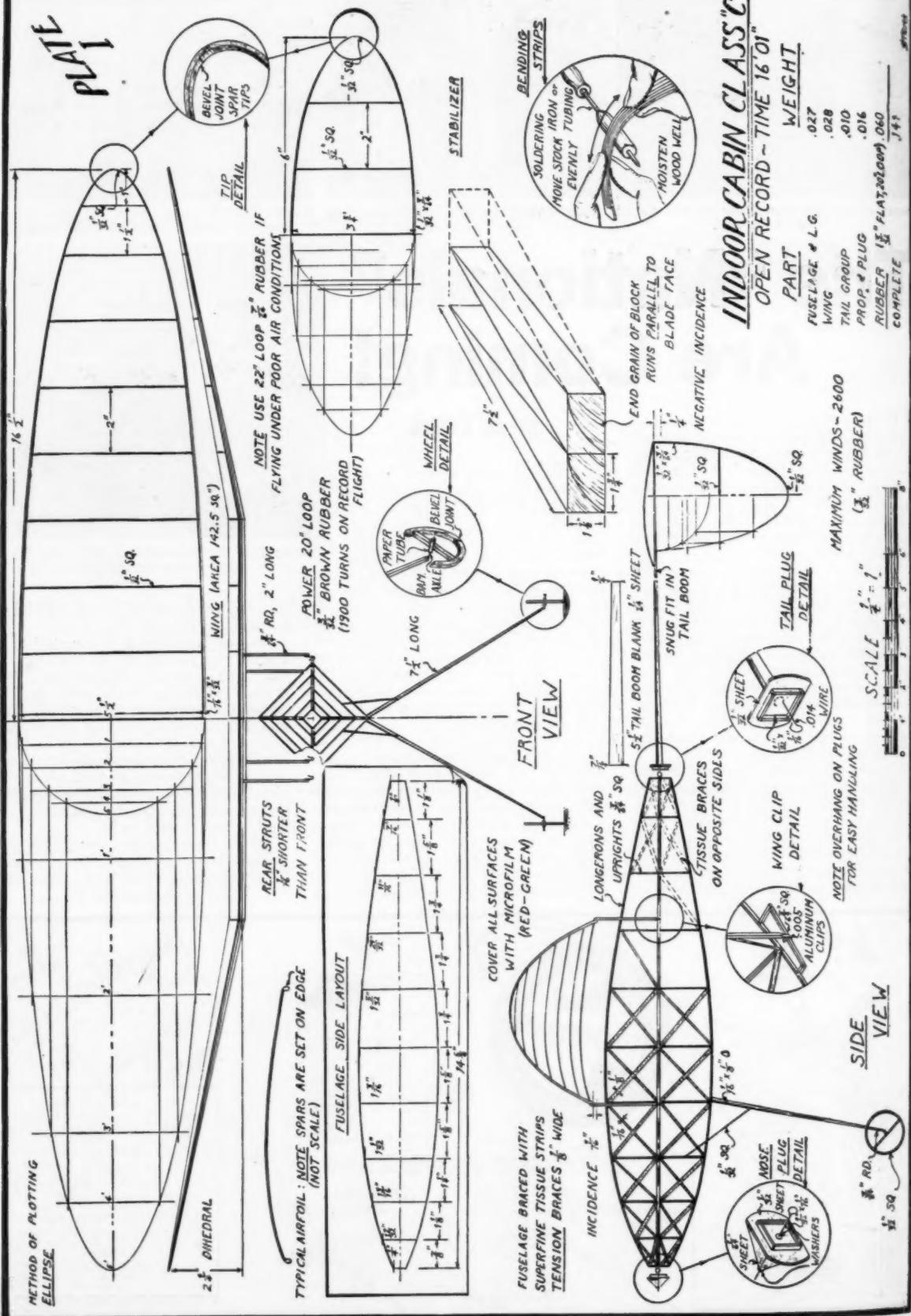
Are you interested in a few statistics? They'll give you an idea of the scope of the national battle: The telephone bill at the Fort Shelby, headquarters for the '38 meet amounted to a mere \$400—and that didn't include pressman Ballou's attempts to call a "friend" in Wyandotte. More'n 5000 letters were mailed from the Shelby, a staggering amount when you visualize the meet managers licking 5000 stamps—but they just stuck to their task until it was cleaned up!

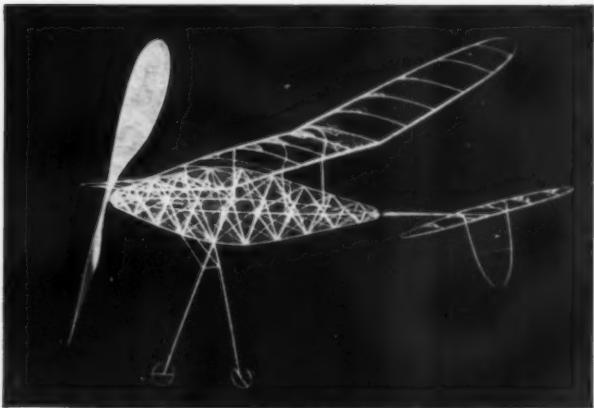
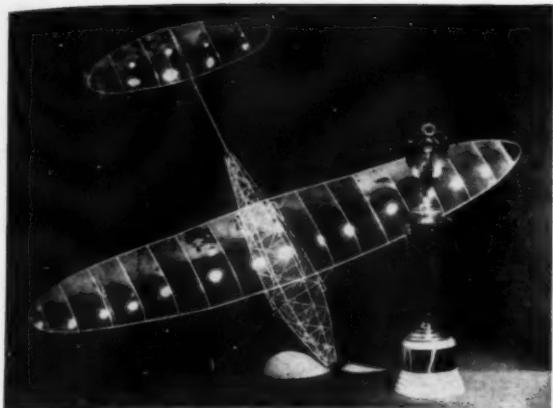
(Continued on page 62)

(Continued on page 62)



METHOD OF PLOTTING ELLIPSE





Two views of the little ship and the trophy it won

The "Indoor Cabin" Nationals Winner

BY HENRY STRUCK

THE CABIN model has been a feature of indoor meets for years but it still attracts scarcely half the number of entrants found in the stick event. As the possessor of a good "cabin" stands a much better chance of making a winning flight, it must be the fragile and complex appearance of this type of ship that keeps the entry list so small. Most of those that are built reflect this impression by a much heavier and stronger construction than necessary, in direct violation of the indoor builder's creed: "Sand it down to nothing—then cut it in half!"

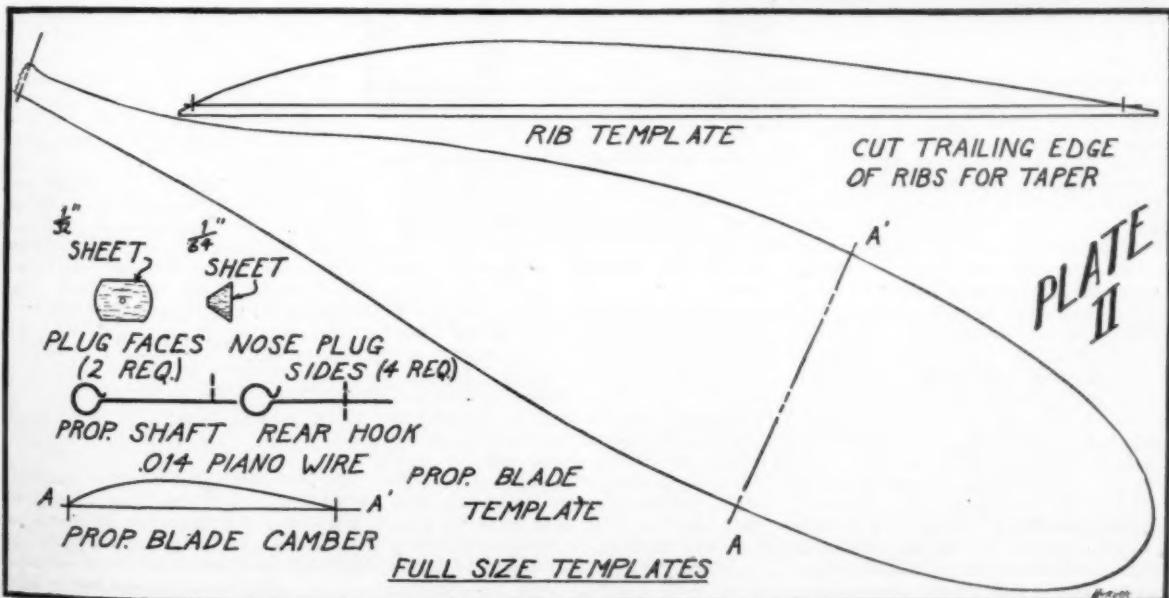
We believe that a cabin can be made as light as a "stick," and still prove itself a stronger model, a more consistent flyer, and capable of nearly as great duration. A

built-up fuselage of large cross section can resist bending and twisting better than a stick, yet need be no heavier than by the weight of the landing gear. By the use of four struts spaced some distance apart the wing may be mounted more rigidly and built lighter without "washing out." As these struts can also be clipped to individual rails the danger of the wing clips crushing a stick fuselage can be eliminated. With the weight of the body and wing comparable, the rest of the model can be kept quite as light as a

(Continued on page 40)

Above—right: Struck winds motor out of plane. Ballas "holds"

Struck hooks motor in fuselage by means of "rod" shown



The Physics of the Airplane

Elasticity and Strength of Materials

By Lt. James P. Eames and Willis L. Nye

UP IN the azure blanket of a summer afternoon sky a tiny speck is dimly outlined against the soft, cottony wisps of lazily floating clouds. As we watch breathless, this tiny speck, flying fast and high, we are suddenly aware that the gentle throbbing of its mighty engine resolves itself into a throaty roar, the throttle wide open, as the craft, which we now perceive to be a silver-skinned navy fighter, suddenly plummets earthward. Down, down, the rhythmic scream of the tortured structural members rises even above the thunder of a full-gunned Twin Wasp engine. Could we be ensconced in the cockpit of this roaring man-made meteor, we would watch the needle of the air-speed indicator crawl shivering up to the 450 knot mark, hesitate slightly, and then pass onward. At the pull-out point of this brutal two-mile plunge, we ask ourselves: "How can this fragile structure withstand this terrific strain of a 9-G power dive?"

For the answer to this self-made query, let us turn briefly to a general discussion of the strength of airplane and engine construction materials. These materials are selected primarily because they possess characteristics which give them extreme lightness in combination with a high degree of resistance to externally applied loads.

The loads encountered by aircraft structural members assume the form of static, or dead loads, as well as dynamic loads. The first type of loadings are those which originate from the weights of the power plant, fuel, structural components, passenger and crew and, in the case of military airplanes, service equipment such as armament, bomb loads and photographic devices. The second class of loadings are encountered when the airplane is subjected to various forms of flight maneuvers. Dynamic loads are measured in terms of the acceleration of gravity occurring under the condition of normal flight. Our navy fighter referred to in the opening paragraph of this article had attained an acceleration of "9-G's" or nine times that experienced in normal flight. When we consider that the weight of the airplane under this condition approximates nine times its normal weight, the enormous problems confronting the engineers and designers of high performance airplanes are brought home sharply to us. For instance, a moderately banked turn tends to impose an acceleration of 3 G's on an airplane structure, while a normal loop accounts for approximately 3.60 G's and normal landings im-

pose as much as 2 G's. The intensity of the dynamic loads depends largely upon the air-speed of the airplane during the course of performance on the involved maneuver. Consequently, the recovery from a steep power dive represents a more severe condition than a normal loop. The present requirements of the U. S. Navy Department do not call for pull-outs on experimental service equipment greater than 7 G's. This is mainly to protect the personnel from violent physical disorders which follow rapid pull-outs at anything above this figure.

Loads which are externally applied to any aircraft structural member, tend to effect a change either in the shape of the member or its original cubical volume. For instance, the flying wires during flight are taut and tend to be stretched beyond their original length. Should the pull, or the tension load which they are designed to resist, become sufficiently



Figure 1. Typical airplane wooden wing spars

great, actual rupture of the wires will occur. Similarly, undercarriage struts at the instant of landing become struts or compression members, since their extremities tend to be pushed together, shortened and crushed. Wing spars tend to bend at their midsection during flight because of the air load which they are supporting as well as from the influence of the tensile loads in the flying wires. Wing spars are also subjected to what is termed a "combined loading," if during certain maneuvers the member is subjected to torsion or twisting. This condition frequently occurs during the dive bombing. The wing spar then must be designed to resist the greatest bending load even while it is subjected to a torsional load resulting from aerodynamic

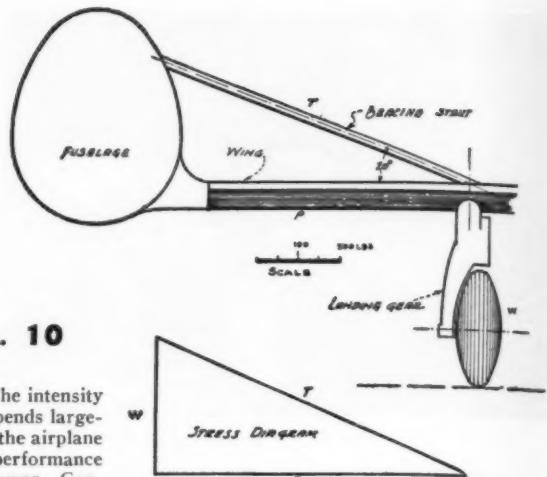


Figure 2. Graphic stress analysis problem

forces acting on the airfoil during certain diving maneuvers.

Airplane bolts and rivets frequently fail under excessive loads which causes one end to slide over the other or what engineers term "shear." Thus we see in all cases that various forms of loads tend to change or distort the parts that comprise the structure of the modern airplane. The distorting force in all cases is termed "stress." For the purpose of simplifying engineering calculations, stress is defined as the "force which is applied per unit area" and it is determined by dividing the total force (external) by the area upon which it is impressed. Upon a casual examination of airplane machine bolts we note that they invariably are made from nickel steel. Nickel steel is very tough and presents a high resistance to shear or tensile forces and, consequently in airplane construction to resist the great forces, nickel steel bolts are universally employed.

The modifications in dimensions which is undergone by a stressed member under the influence of externally applied loads is called strain. Thus we see that the term "stress" is applied to the acting force, while the term "strain" is applied to the effect which is produced.

For instance, let us calculate the strain in the flying wire of a biplane structure. The original length is 25 feet. When proof-loaded prior to installation, it is found to be stretched .60 inches. What is the strain in the wire? The equation for this is given as follows:

$$\text{Strain} = \frac{\text{Increase in length}}{\text{Original length}}$$

$$.60 = 1/20 \text{ foot} = 0.05 \text{ foot}$$

$$\text{Strain} = \frac{.05}{25} = 0.0005 \text{ ft. per ft. of length}$$

It is evident that airplane materials must be sufficiently resilient to resist the acquisition of a permanent set after being distorted by externally applied loads. The physical property underlying recovery
(Continued on page 36)



A British torpedo plane "lays its egg." (Internl.)



The Olivier trans-Atlantic flying boat. (Acme)

FRONTIERS OF AVIATION

BY ROBERT C. MORRISON

THE MOST important fact concerning the American aviation industry is that its activities are based on a system. Nowhere else in the world is the design and production of aircraft accomplished so systematically; not even in Germany. This is the main reason why the United States has remained in the lead for so long and may continue to do so for some years to come. We are very much removed from the time when the airplane designer had to design the propeller, the wheels and the engine, besides the plane itself, before he had a complete product. The industry is now composed of many manufacturers specializing in one type of work with a definite goal in mind. There are enough manufacturers in each type of business to make keen competition and maintain activities at high pitch.

The airlines, the Army and Navy know what they desire in the design of an airplane, and they make this clear to the designer in very systematic and definite form; giving him concrete facts to work on. After a newly created propeller or engine is thoroughly tested it is approved by the Army, Navy, or Civil Aeronautic Authority as the case may be, and when the manufacturer receives this propeller or engine he knows that it is reliable. Then when his plane is designed according to data compiled through years of

experience by the National Advisory Committee for Aeronautics and other such organizations, he knows his airplane will fly close to expectations even before it is built.

In certain countries abroad the design and production of aircraft have been in such discontinuity that there is no method of comparing the achievements in the past with those of the present. Some

of their airplanes are good; others are not. In the United States among the major manufacturers their latest products are invariably much superior to the previous ones. One of the keynotes in this trend is the increased efficiency. A shining example of this is Consolidated's new

(Continued on page 30)



The first Canadian pursuit plane, built by the Canadian Car and Foundry Co., has a speed of more than 300 m.p.h.



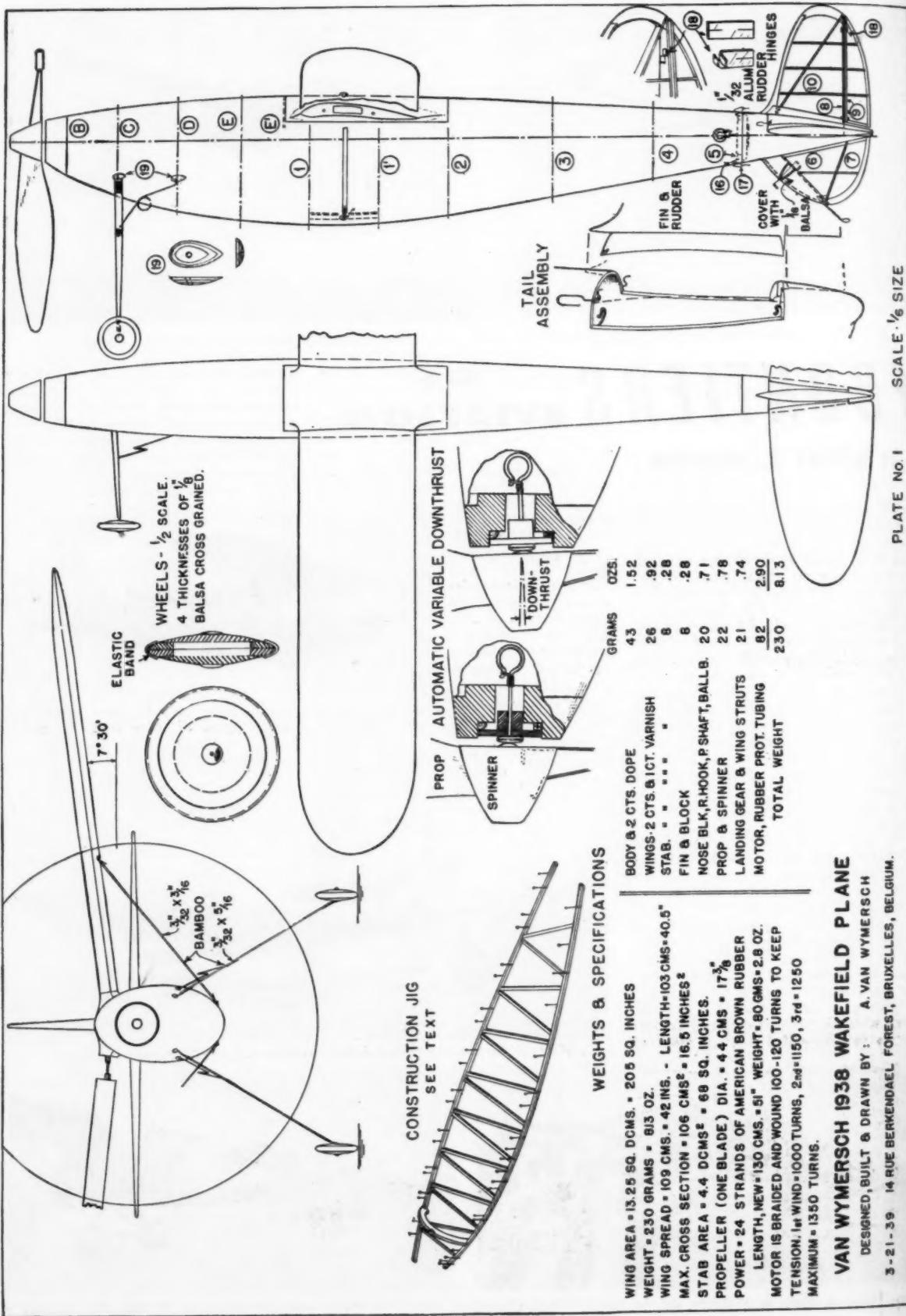
One of the Seversky XP-41 fighters purchased by the U.S. Army. (Acme)



New Polish bombers at Mokatow are the equal of any. (Acme)



Line of Polish training pursuit planes at Mokatow. (Acme)



WING AREA = 13.25 SQ. CMS. = 205 SQ. INCHES
WEIGHT = 230 GRAMS = .813 OZ.
WING SPREAD = 109 CMS. = .42 IN. LENGTH = 103 CMS = 40.5"
MAX. CROSS SECTION = 106 CMS² = 16.5 INCHES²
STAB. AREA = 4.4 DCMS² = .68 SQ. INCHES.
PROPELLER (ONE BLADE) DIA. = 44 CMS = $17\frac{3}{8}$ "
POWER = 24 STRANDS OF AMERICAN BROWN RUBBER
LENGTH, NEW = 130 CMS. = .51" WEIGHT = 90 GMS 2.8 OZ.
MOTOR IS BRAIDED AND WOUND 100-120 TURNS TO KEEP
TENSION. 1st WIND = 1000 TURNS, 2nd = 1150, 3rd = 1250
MAXIMUM = 1350 TURNS.

VAN WYMERSCH 1938 WAKEFIELD PLANE

DESIGNED, BUILT & DRAWN BY : A. VAN WYMERSCH

3-21-39 14 RUE BERKENDAEL FOREST, BRUXELLES, BELGIUM.

A Super Streamline Wakefield Model

How You Can Build a Consistently Flying Model That Has Placed in Nearly Every European Contest

By ALFRED VANWYMERSCHE

THE MODEL we present here is our fourth development of monocoque contest models. The first two had bodies hollowed out of a block of balsa. As this was definitely too heavy we resigned ourselves to planking the fuselages, and immediately found this much less difficult than we had imagined it would be. This model flew and still flies well, but was a bit tail-heavy.

This last model is therefore an improved version, also having the nose lengthened about two inches. That we now have the right proportions is proven by three other models which were found to be in perfect balance. Of course it is necessary to observe carefully the weights given on the plan.

The plane has consistently made long flights and still after a year's flying, it will turn in average flights of three and a half minutes in calm non-thermal weather.

Its official flights in some contests were: April '38: Gand 48" (Belgian record at that time). May '38: Namur 4'55".

June '38: Fourth at international contest in Paris. July '38: Tirmont. Won with two flights 3'21" and 3'27". 31st of July '38: Wakefield Cup at Paris. 10th place; first on Belgian team. Aug. '38: Coupe du Roi or King's Cup (international) 3rd place with 7'24", 3'6", 3'23".

The Wakefield contest held a lesson all its own which is worth telling. Following our usual practice, the plane exceeded minimum weight by a third of an ounce. However it was a very recent edition so it happened that the terrific heat during the day preceding the competition completely modified the weight,

settings and balance. In fact the plane just barely had the required weight when it was weighed in. On the first flight, after a spectacular climb the nose block fell out somehow. This seeming cause for the following series of stalls only served to hide that the plane was deregulated, and it was only after the second flight that we woke up and corrected the settings. It then made a flight approaching five minutes. The moral of the story is: It does no harm to try out the plane before the contest.



Monocoque body and single blade prop give strength and efficiency

This automatic "down-thrust" also helps a great deal since, without it, we had to use quite a bit of so-called "down-thrust" (see Mr. MacLean, page 15, Feb. '39) on account of the burst of power when wound up full. However at anything under the maximum power the ship flew better (more efficiently) without "down-thrust." In other words, the "down-thrust" was just a parasite load on the nose of the plane after the first five seconds motor run. The gadget we use makes for a more continuous and longer climb in practice.

One last word before giving the construction. Our 1939 model will differ only in small details and notably in that it will use a folding prop.

Wings. The builder must first redraw the wings full-size on ordinary paper. Don't forget to draw one left and one right wing. The original wing ribs were cut on a bandsaw and were hollow. This was not done to gain a bit of weight but rather for ease of assembly, to permit the spars to be placed inside the

wing in such a manner that they do not touch the covering, thereby producing a more perfect covering job. Also this permitted an easier use of bisymmetrical spars or rather of tapered section. The usual strongly cambered wing has a tendency to curl upwards on account of the tension of the covering. To avoid this raise the center line of resistance of the spars by putting more strength at the top of the spar. This of course is the case of the spar of the tapered section.

However, for those who have not access to a small band saw we have given a substitute rib which will give equal satisfaction. These ribs are given full size and should be carefully traced out on a piece of plywood. Using this plywood rib, you can carefully cut your ribs, which should be one-sixteenth of an inch thick. Note that you will need two of one-eighth thick and two of one-fourth inch thick. Carefully assemble and glue the different parts together. When dry attach a dress snap to the underside of each wing at the point indicated. These snaps are best attached with aluminum strip woven in and out of two opposite holes in the snap. Glue a small sheet of balsa on each side of the rib for the paper to stick to. You should then glue the two pieces of aluminum tubing in the end rib of each half

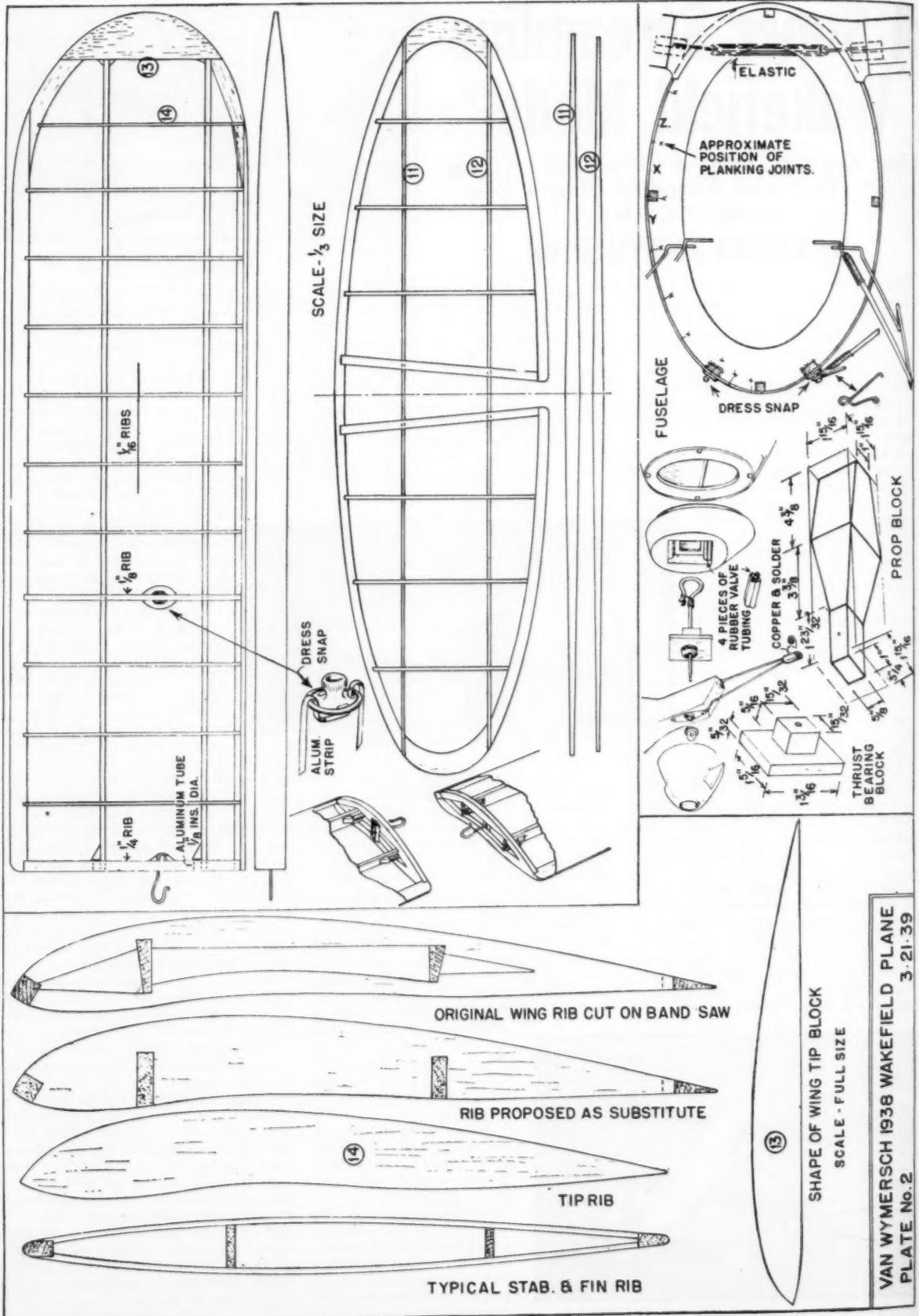
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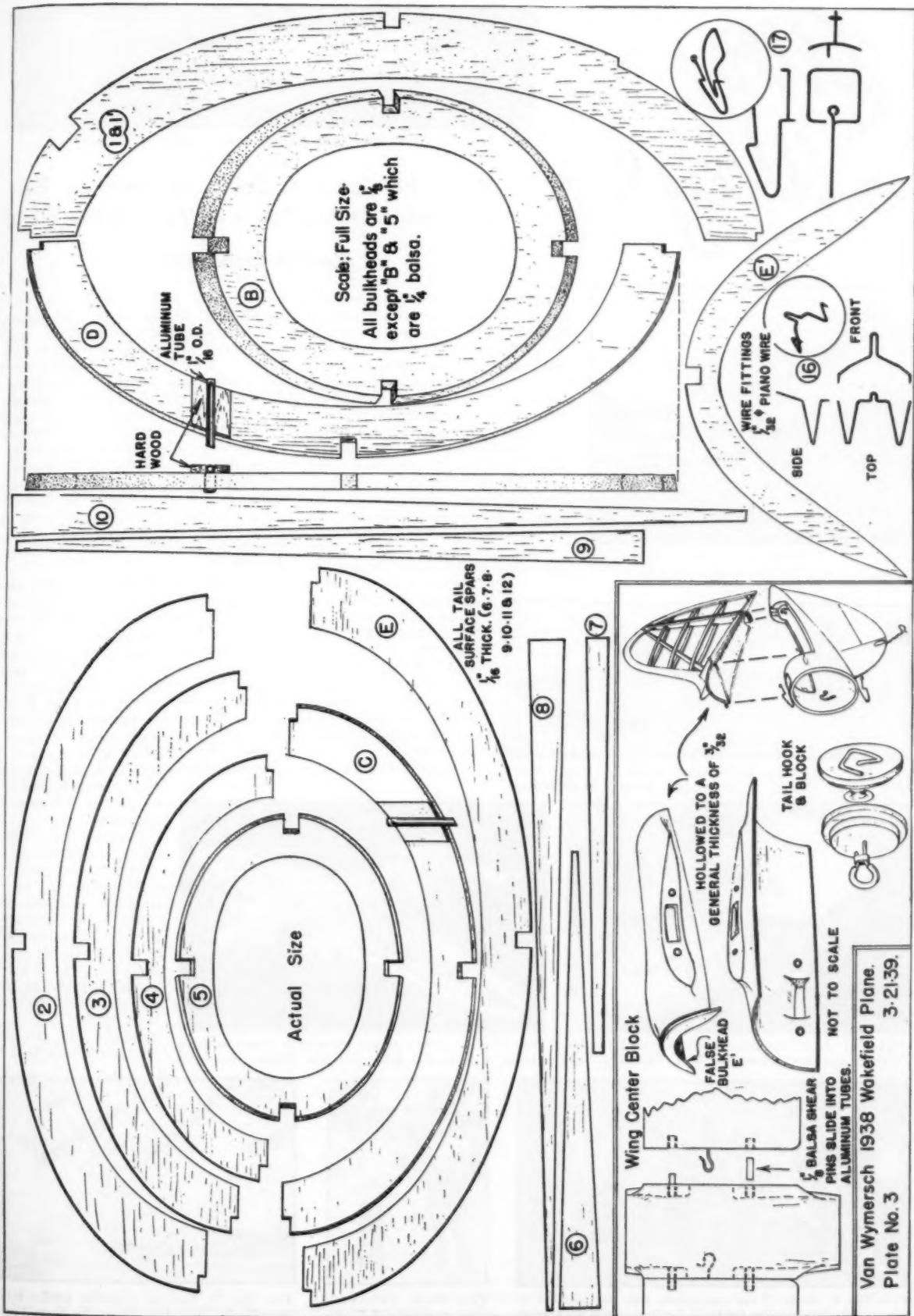


It slides through the air with the greatest of ease



A high aspect ratio provides soaring efficiency



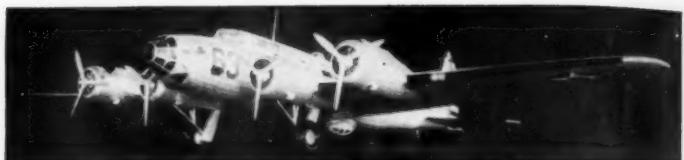


Van Wymersch 1938 Wakefield Plane.
Plate No. 3
3-2139

Air Ways



Pict. No. 1. A flying scale Boeing B-17 bomber by K. A. Pouch



Pict. No. 1. A flying scale Boeing B-17 bomber by K. A. Pouch

What Readers Are Doing to Increase Their Knowledge of Aviation in All Parts of the World

Airways Club News

FINE flying weather has brought our model builders out to the flying fields in "droves." There appears to be many newcomers to this field of sport—many of the younger fellows having become interested and are taking it up as a serious hobby. We hear from many points throughout the country that new clubs of beginners have sprung up. From this it looks as if in a few years we will have a huge "crop" of expert builders and fliers. Unquestionably the sport is gaining new adherents with each succeeding day.

A large percentage of the builders now are thinking of the National and

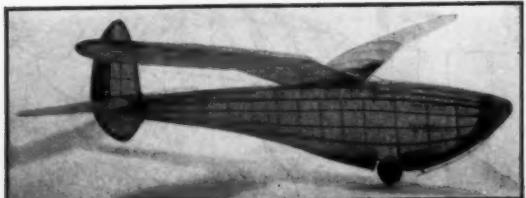
Wakefield Meets and of building that "super dream ship" that will "clean up." Nevertheless there are other model builders who follow a more conservative path—confining their dreams to scale ships and refinements of workmanship.

As an example of this

latter type of work, we wish to call your attention to picture No. 1. This is one of the most remarkable flying scale models that has ever been shown in "Air Ways." Actually it looks like a detailed scale, non-flying model. It is a Boeing B17 Flying Fortress, built by K. A. Pouch of New Brighton, New York. It has a span of 44 inches and all details are truly represented. When not used for exhibition, rubber motors may be inserted, which extend back from the wing through the motor. It flies well but not very far, as the primary object was to build an exact likeness to the full scale plane. Pouch has our congratulations on his fine work.

David Bailey of 152 Stormont Street, New Concord, Ohio, conceived the idea of building a glider of similar shape to Jim Cahill's famous "Clodhopper." It is shown in picture No. 2. As you can see, the ship is particularly adapted to a glider. The wheel is located at the bottom of the deep part of the body. Bailey says: "It gives a remarkable performance which is characterized by the extremely flat and slow glide." He is a junior at Muskingum College and is well on the way toward becoming an aeronautical engineer.

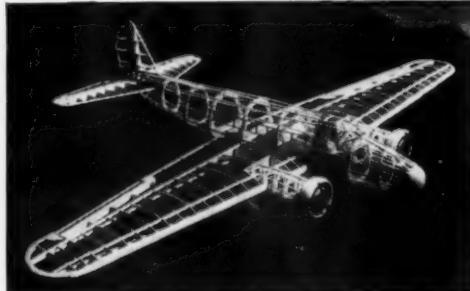
Those who are interested in fine construction should note carefully picture No. 3, which shows a model of the Boeing 247 Transport, built by Milan Campbell of 37 Main Street, Wellsville, Pa. It has a 36 inch spread. As you can see, the details have been worked out most carefully. In fact the framework looks as if it



Pict. No. 2. A beautiful soaring glider by David Bailey, of a design similar to J. Cahill's famous "Clodhopper."



Pict. No. 4. J. Huntley builds a model of the Wright brothers' plane for N.Y. World's Fair



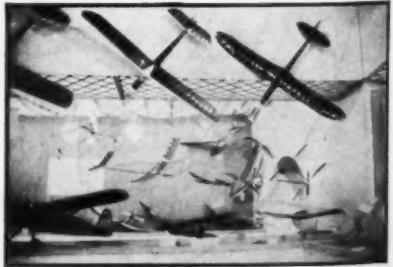
Pict. No. 3. Look at the structural detail of this plane. A beautiful job, eh? (By Milan Campbell)



Pict. No. 8. Some of the contestants who participated in the recent meet held by the Hi-Y Aeronauts and Rocketeers



Pict. No. 6. Two champion modelers of China



Pict. No. 5. Part of a model exhibit held recently in Belgium. Note the many types

might be that of the full scale ship. The picture was taken by Pete Grego, professional photographer, and it illustrates well the fact that it pays to take fine photographs.

Mr. Bill Baker, who is on the staff of the State of North Carolina Department of Conservation and Development, Raleigh, sends us picture No. 4. This shows Mr. James R. Huntley, student at N.C. State College, working on the exact scale model of the Wright brothers' first successful plane. This model appears in the North Carolina exhibit at the New York World's Fair. North Carolina is the birthplace of aviation, Orville and Wilbur Wright having made their first flight at Kitty Hawk, N.C.

MODEL NEWS FROM OTHER COUNTRIES

Belgium

One of MODEL AIRPLANE NEWS oldest foreign readers is Alfred Van Wymersch of 14 rue Berkendael, Forest, Brux, Belgium. He now sends us picture No. 5, which shows a group of models at one of the recent exhibitions in Belgium. If you look closely, you will see that about every type of model is represented—from helicopter to soaring gliders. The article entitled "Super Streamline Wakefield Model" describes Mr. Van Wymersch's Wakefield model, which he flew last year in France in the International Competition and obtained some beautiful flights. It is most consistent in its performance.

China

It is hard to imagine that the young men of China have time for model flying, considering the fighting which is going on in that unfortunate country. Nevertheless Mr. S. Way of the Hong Kong Model Airplane Club sends us picture No. 6, which shows, left to right, Mr. Lo Kwong Yip, the champion flier of the club, and Mr. Chan Puk Ying who placed second in one of their recent contests. Judging from the planes they are holding, these young men are evidently expert model builders. On behalf of all model builders we wish this club every success. The plane which appears in the background is a twin engine Douglass transport.

Norway

Mr. Arue Dragsues of Paul Fjermstads vei 71, Strinda, pr. Trondheim, Norway, sends us some interesting information concerning model activities in this part of the world. He says that in his country model flying is not a very old sport. About two or three years ago a weekly magazine named "Allers" started the "Allers Flyveklubb" (Aeroclub of Allers) and this organization already has about 100,000 members. Through this magazine the youth of Norway are becoming air-minded. Dragsues says:

"Most of the boys from ten to sixteen years of age participate in model plane flying. When they reach sixteen they generally join a sailplane club. In the last two Wakefield Competitions very excellent models have been entered by Norwegian boys. However these young men were only fourteen or fifteen and lacked experience in flying in this type of

contest.

"Here gas models are practically nonexistent, though we are extremely interested in this type of ship. Our one difficulty is that we have to buy foreign motors. This is a great draw-back due to the excessive costs."

CLUB NEWS

New York

Our trick photographers are still at it! Picture No. 7 is not what it appears to be. Actually it is a composite of four different pictures: The sky is from a photograph taken at Flushing, Long Island, New York; the woods and land in the background is another part of Long Island; the river is the Seine River in France and the plane is a flying scale model of a Supermarine racer. It was built by Alfred G. Young of 42-37 Union Street, Flushing, who is a member of a newly organized model club in Flushing. Though they held their first meeting last month, already there are a dozen men and boys who are members. We wish them every success in their coming activities.

Iowa

The Hi-Y Aeronauts of Fairfield High School, Fairfield, Iowa, staged a "Flyin' Fools Jamboree" on April 22nd. Picture No. 8, sent to us by Don Fuqua of 507 North 4th Street, shows a line-up of some contestants with their models. The contest was a dual meet between the Aeronauts and the Rocketeer Aero Club of Ottumwa, Iowa, with Fred Dickey of the Hi-Y Club the winner. In the picture the two club heads stand side by side on the left. Fuqua is third from the left, and Claude McCullough is fourth. There were many more contestants than shown in the picture. Both indoor and outdoor events were staged, six events in all.

Wisconsin

James R. Custin of 2720 North Palmer Street, Milwaukee, Wisconsin, writes and tells us that on March 24th the first copy of the official newspaper of the Milwaukee N.A.A. Chapters was published, under the name of "Skywriting." We congratulate these groups on the "birth" of their new "baby." This little sheet will give all of the activities which take place in the neighborhood of Milwaukee.

Kansas

One of the most active states in the model field is Kansas, and our old I.G.M.A.A. director, Mr. Leo Rutledge, has been largely responsible for this great show of activity. Model building is being organized throughout the whole state, which was accomplished as follows:

In December, at the request of Governor Ratner, a conference of aviation leaders from all over the state was called at Topeka. Out of this conference the Kansas State Aviation Association was formed, which was to boost aviation in every possible manner. Mr. Rutledge was elected to the board of directors.

At the first meeting of the board of directors, held in Wichita in February, he went before them and secured permission to form the Model Aeronautics Division. The plan is to organize all the clubs

throughout the state, inasmuch as these clubs now are drifting aimlessly without organization. Recently a Model Aeronautics Convention was called in Wichita (April 15 and 16th) and every boy residing in Kansas who was interested in aviation was invited. They elected their own officers and set up their own organization. All activities throughout the state will be under the supervision of the Model Aeronautics Division of the Kansas State Aviation Association. A series of contests will evolve and the whole activity will be handled in a systematic and well-organized fashion.

California

Mrs. J. R. Machado sends us some information about a new club which was formed at Laton, Calif. Picture No. 9 shows a group of its members assembled for a contest. Mrs. Machado says:

"The Laton Arobugs of Laton, Calif., P.O. Box 109, was organized in November 1938 under the leadership of Mr. John R. Machado. The purpose of the organization is to guide and direct the aeronautical interest and activities of the airminded youths through the proper supervision of model competition, and to furnish them with an interesting and worthwhile activity for their leisure time.

"With MODEL AIRPLANE NEWS helping us, we are growing rapidly; at present having thirty members between the ages of 12 and 21. Your magazine is read eagerly here and in due time we hope to be well known in the field of model competition.

"Our weather conditions here at Laton are ideal for model flying. We have unlimited open space and in the summer the thermals are amazing. We are anxious for the arrival of summer to see what our planes will really do."

New York

Dewitt Blossom of 99 Maple Place, Freeport, New York; vice-president of the Freeport Model Aero Club, tells us that they have a very active group of about forty members; ten of these members owning gasoline powered models. For indoor work the club is making use of a gymnasium in the local high school. The ceiling of this gym is about forty feet and about three minutes is the average flight time of microfilm models.

New York

John Schneider of 355 Mohawk Avenue, Scotia, N.Y., vice-president of the Schenectady Aeroneers, writes:

"At last we have a model club in Schenectady which we believe is going places. On December 16th last, twelve of us met at the home of Jack Thelan, now our club secretary, and formed the Schenectady Aeroneers. Since then we have held weekly meetings and our membership has increased to 28 members. Of these 4 are junior class, 15 are senior class and 9 are open class members.

"We have not lacked for interesting meetings as shown by the following: Talks on 'Stabilizing Your Models,' 'Designing a Stability Model,' (from articles in M.A.N.), 'Weather Conditions and (Continued on page 44)

National Aeronautic Association Junior Membership News



Prepared by National Aeronautic Association, Dupont Circle, Washington, D. C.

A form containing details about the new gas model insurance and an official application will be sent upon request. Send a card to the National Aeronautic Association, Dupont Circle, Washington, D.C., stating whether or not you are a member of the N.A.A. Gas Model Division, and you shall receive your copy immediately.

Another International Contest

The American International Contest for the Admiral Moffet trophy will be held in connection with the American National Model Airplane Championship Meet in Detroit, Michigan, July 5th to 9th. The following rules will be in effect: Models in this contest shall be of the cabin type with built-up, closed fuselage and shall resemble man-carrying aircraft. The minimum area of the maximum cross section shall correspond to the formula $L^2/100$, where "L" equals over-all length of the model, excluding the propeller. Full size drawings of maximum cross section shall be submitted. The fuselage shall be of approximate streamline form and have not less than 90% of its surface area covered. Outriggers and booms may be used on fuselage type models.

The fuselage shall be a structure which supports the motor, wings, empennage, and landing gear. Any type of power is permitted except gas. When rubber is used for motive power it shall be contained entirely within the fuselage.

Models in this contest shall have a wing area of not less than 100 square inches and not over 200 square inches and shall weigh 3 ounces for every 100 square inches of wing area.

Models must be of the rise-off-the-ground type with a landing gear that permits them to take off from the ground from a standstill under their own power. The landing gear must be strong enough to support the model while taking off and landing and its usefulness must be demonstrated by gliding the model from a height of at least four feet, landing without damage and without nosing over. The wheels shall turn freely and shall be of a diameter of no less than 1 1/2 inches.

Only one model is permitted for each contestant. The winner is determined by the average of three flights.

Each country may be represented by a team of six members. Foreign entries except Canadian, may be flown by proxy if the owners are unable to attend.

The six highest duration flights made by Canadian entries and the six highest duration flights made by United States entries in the Outdoor Rubber Powered Cabin Contest will comprise the Canadian and United States Teams for the Admiral Moffet International Contest, and only members of such teams are eligible to compete in this Contest. Foreign entries must reach the Contest Director at Hotel Fort

National Meet Entry Blanks!

Entry blanks for this year's National Meet may be obtained by sending a self-addressed, stamped envelope to the *Registrar, Twelfth National Championship Model Airplane Meet, Hotel Fort Shelby, Detroit, Michigan.*

Each rule book comes with one entry blank. Clubs requiring more than one entry blank and set of rules are requested to enclose 5c or 10c in stamps to cover mailing, depending on the number required.

Shelby, Detroit, Michigan, not later than July 4th.

Official Model Flight Time

N.A.A. has received a number of letters requesting an interpretation of the new ruling governing the method of determining official flight times.

In order to eliminate to a greater extent the element of luck, and in order to encourage finer workmanship and design in model aircraft, the Academy of Model Aeronautics changed the rules to read "Scoring time shall be the average elapsed time of three official flights." This means that the three official flights turned in by a model shall be averaged; this average to be entered as the flyer's official time. In order to make sure that the flyer takes advantage of all three official flights, rather than stop with one or two, the Academy further ruled that the total elapsed time should be divided by three, representing the three official flights allowed.

New N.A.A. Model Chapters

For the benefit of modelers interested in contacting new N.A.A. Model Chapters, we here list a number of those which have recently joined the National Aeronautic Association. The name of the club is in italics, immediately followed by their official representative, who is the man to contact about club matters:

Schenectady Aeroneers GMC (gas model chapter); John Schneider, 355 Mohawk

Avenue, Scotia, N.Y. *Kewanee GMC*; F. W. Priestman, 330 McKinley Ave., Kewanee, Ill. *Missoula Gas Model Aviation Club*; Ed Simons, 208 S. Fifth, W., Missoula, Montana. *New Britain Aero Club*; Frank W. Schade, No. 402, City Hall, New Britain, Conn. *Madison GMC*; Harvey L. Bartsch, 10 N. Hancock St., Madison, Wisc. *Mile High Modelers*; Dr. Newton Ferguson, Bashford Block, Prescott, Arizona. *Savannah Gas Model Engineers*; J. T. Landsberg, 1301 E. Duffy St., Savannah, Ga. *North Store Junior Craftsmen*; Irving H. Lamson, 406 S. Genesee St., Waukegan, Ill. *Muncie "Gas Hawks"*; Herschel Knight, 514 S. Proud St., Muncie, Ind. *Ames "Prop Busters" GMC*; Charles G. Ray, 223 South Russell, Ames, Iowa. *Sioux Helldivers GMC*; Glenn A. Gehan, 2708 Myrtle St., Sioux City, Iowa. *Portland Flying Service GMC*; Clayton H. Tucker, 81 Sherwood St., Portland, Maine. *Aero-Craftsmen GMC*; Theodore W. Schindler, 3221 Brightwood Ave., Baltimore, Md. *East Paterson GMC*; Hand Schroeder, 154 Maher Avenue, Clifton, N.J. *Capitol Aviation Society, Gas Model Division*; Albert L. Hurd, 17 Locust Park, Stop 29, Albany-Schenectady Rd., Albany, N.Y. *East Rockaway Model Chapter*; John L. Scherer, Box 35, East Rockaway, L.I., N.Y. *Queens Aero Model Assn.*; John L. Ogilvie, 350 E. 84th St., New York, N.Y. *Tuscarawas Co. Model Airplane Club*; Wm. H. Gowan, Jr., 422 Ray Avenue, N.E., New Philadelphia, Pa. *Portland GMC*; Harry N. Fosbury, 5409 S.E., 92nd Ave., Portland, Oregon. *Flying Keystone Model Airplane Club*; Ernest Schaffhauser, 717 Greenleaf St., Allentown, Penna. *Burlington Junior Chapter*; John Couture, 28 Hungerford Terrace, Burlington, Vermont. *V.F.W. GMC*; Roger Williams, 197 Liberty Ave., Clarksburg, W. Va. *Clipper City GMC*; Kenneth C. Healy, 1207 S. 8th St., Manitowoc, Wisc. *Milwaukee Aeromutts MC*; James Noonan, 2015 W. Wisconsin Ave., Milwaukee, Wisconsin. *Wheatland Junior Chapter*; Dr. L. B. Secrest, Wheatland, Wyoming.

If you live in the vicinity of one of these clubs, their representative will be very glad to hear from you regarding your interest in model building, and shall be glad to tell you how to join. Without doubt they can show you a couple of building and flying kinks which you never dreamed of, and it may be that you can help a couple of them over a rough spot. It is an established fact

(Continued on page 63)



Pict. No. 1. A metal gas job by Bob Johnson



Pict. No. 2. A Douglas transport gas model with flaps



Pict. No. 3. Fine workmanship is displayed in this Stinson



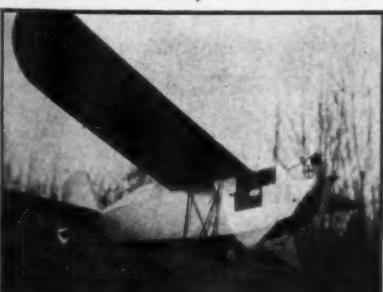
Pict. No. 4. The first place winner, Class B, in the Metropolitan Model League contest



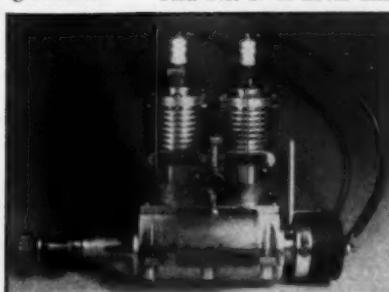
Pict. No. 5. Dudley Whitman and his first gas model



Pict. No. 6. A novel tank



Pict. No. 7. Bob Whittier's "radio" plane



Pict. No. 8. A smooth running "twin"



Pict. No. 9. Jack Schwartz and his gyro

GAS LINES

Official Section of the National Aeronautic Association Gas Model Division

The I.G.M.A.A. Has Been Reorganized. All Old Units May Become Affiliated With the New Organization by Making Application

HERE seems to be no end to the progress that can be made in the designing and building of gas models. With each succeeding day new types are appearing on the flying field, and old types are reappearing with refinements in their design that in the

future is bound to reflect in the design of full size craft.

A few examples of unusual designs and fine workmanship have been sent in to us by readers. One of the most unusual contributions is shown in picture No. 1. It is a metal gas job built in complete detail by Robert E. Johnson of 1505 North Occidental Boulevard, Los Angeles, Calif. Mr. Johnson says it is built entirely of Dural and is of knocked-down construction throughout. The pipes are threaded for screws and the wing ribs fitted with slots. The total weight is 8 pounds, ready to fly, when powered with a Forster Brothers engine. The object of the point in the center of each wing is to direct the wind current over this point, causing less vacuum and therefore greatly increasing the speed. It has flown very successfully and it seems no matter how it lands it cannot be damaged beyond repair.

The ship has a span of 5 feet and has 5 square feet of area. Thus the wing loading is 1.6 pounds per square foot. No wonder it has plenty of speed!! Johnson says the high speed is approximately 50 m.p.h. The structure is made of 14-gauge Dural.

Picture No. 2 shows that gas model builders cannot be "stopped" by complications. Here you see a twin motor Douglas with flaps that operate. It has been sent to us by James W. Inglis of 1923 Eckhart Street South, South San Gabriel, Calif. The picture was taken at a contest held in December, 1938, at the Los Angeles Model Airport, where it made ten successful flights. The plane has a 10 foot wing spread and is 7 feet in length. It is powered with two Brown motors. The landing flaps drop as the motors stop. The total weight is 13 pounds and it cost about \$70 to complete. It was designed by Clyde

(Continued on page 56)

HOW TO MAKE YOUR MODEL BEHAVE

Article Number 86
Chapter Number 6

By CHARLES HAMPSON GRANT

How You Can Control the Circling Characteristics of Your Model Plane When It Is In Flight

IN THE last instalment of this series of articles, an explanation was given to show the reader how he may check his model for various types of stability when it is in flight. Also, it was shown what adjustments should be made in order that the model would fly along a normal course. The object was to attain a maximum climb without stalling and to have the model follow a reasonably stable flight course, without excessive banking. It was assumed that the model would fly approximately straight, turns were not considered. However, if you have made the adjustments which have been suggested in the preceding article without apparent success in regard to having your model execute a normal flight, it is possible that other minor causes may exist. These might be: wings which are warped out of shape, distorted tail surfaces or, possibly, the propeller is developing too much torque.

If the suggested corrections have failed to remedy the situation, your next step should be to check the wings carefully in order to be sure that no warping exists. At the various points along the wing from tip to tip the wing should have exactly the same angle of attack. One wing tip should not be turned down sharply and the other one turned up. In other words, be sure that both wings have identical attitudes. Thus whether or not the wings are "true" may be determined by sighting along the leading and trailing edges from a point about a foot and a half in front of the nose of the model. From this point look along the wing on both sides, keeping the model in the same position at all times. If equal amounts of the under surfaces of each wing show beneath the leading edge when the tail is dropped slightly, then you may be sure that both wings have the same angle of attack. Some model builders believe that one wing (usually the left wing looking from the tail) should have a greater angle than the other in order to create a compensating effect for the torque. This condition is not at all necessary.

It is true that in many cases giving the left wing "wash in," as it is called, and the right wing "wash out," overcomes the tendency of the plane to turn to the left due to the torque. However, correcting the torque in this manner usually brings in unwanted difficulties. At higher angles of attack or higher climbing angles the left wing will cause a greater drag than

the right wing, rather than a greater lift. This occurs many times in a glide and the reactions of the plane are usually difficult to diagnose. Therefore, it is better to eliminate any possibility for complicated and undesirable maneuvers that the plane may execute. Thus we advise you to make both wings of equal angle of attack without "wash in" or "wash out."

Next, you should check the tail surfaces and be sure that the stabilizer has the same angle of attack throughout its span. Contrary to the opinion of model builders the rudder should be set in a neutral position. When you have checked your plane in regard to all these factors and have made sure that the angle of the wing and the stabilizer as well as the position of the wing is accurate, test-fly your plane.

By checking all of these factors described, you have eliminated the cause of many difficulties. Thus you have narrowed down the possibility of error and have made it easy to determine the cause of any trouble that may still exist in respect to the stability or control of your model.

If after taking these precautions your model banks steeply and turns sharply to the left you may be assured that it is not due to wing warpage or an improperly set rudder. Provided the wing and tail setting and the fundamental design of the ship are correct, you may be certain that the cause of your trouble is due to propeller torque. If the model turns abruptly to the left but does not bank excessively to the left then the trouble is probably due to too large a rudder.

Let us consider the first instance; i.e., that there is too much torque. The first instinct of a model builder is to make correction of this condition by turning the rudder to the right or by giving "wash in" to the left wing. This may cure this particular difficulty. However, it usually induces other troubles, and often these do not show up until the model assumes some unusual flight position. Then it does not pass through the normal sequence of recovery reactions. This means of correction is not advised. It appears that the most obvious thing to do if the torque is excessive is to take some means of reducing the intensity of the torque. This is not impossible in most cases, for where the torque is excessive it usually is an indication that the propeller is improperly designed.

If you can determine the reason for excessive torque then you have solved your

trouble. The torque of any propeller is due to the resistance it produces when revolving. Excessive resistance usually is an indication of inefficiency. In other words, the resistance is high but the thrust is low comparatively. This leads us up to the whole cause of the trouble.

A propeller gives an excessive resistance in nine cases out of ten when the blades are passing through the air at *too high an angle of attack*. The blades of an efficient propeller pass through the air at an angle of attack of approximately four degrees to seven degrees; for at this angle the airfoil composing the blade gives a maximum thrust-drag ratio. Having determined this, it is natural for one to ask "Well, how are you going to correct the trouble?" The answer is quite simple. The blades of this particular propeller should have *greater area*. Thus the blade is able to produce the same thrust at a smaller angle of attack. If the propeller is producing great torque in the first place, probably the blades are passing through the air at ten or twelve degrees. By increasing the area of the blades, the angle of attack would be reduced considerably. The reduction would be in proportion to the increase in area.

There is no simple rule which tells exactly how much area to use on a propeller blade, for a propeller should have various amounts of area for different propeller pitches. The greater the amount of area in respect to the propeller pitch, the greater will be the climbing angle of the plane. These points were discussed at greater length in previous articles which dealt with propeller design. Briefly, for any given pitch and desired angle of climb, the propeller blade area should be proportional to the wing area. For a comparatively steep angle of climb the area of the blades should be approximately 15% of the wing area, when the pitch of the propeller is equal to 1-1/2 times its diameter. Thus when you meet a condition where the propeller of your plane is generating excessive torque, replace the propeller with one which has greater blade area. It is better to have too much area than too little area. You will find also that your plane will fly with less power instead of the great power required for the larger propeller. If you do not wish to follow this procedure you may obtain the same result by making the blade area the same and reducing the pitch of the propeller. This will have the same desired effect.

(Continued on page 66)

FLASH-NEWS

SPECIAL TO MODEL AIRPLANE NEWS:

ORDERED by the United States Army Air Corps: 400 Curtiss XP-40 pursuit planes (MODEL AIRPLANE News, February, 1939) powered by Allison engines at a cost of \$12,872,398; four Consolidated Mystery Model 24 four-engined bombers at a cost of \$2,880,000; thirteen Lockheed XP-38 (MODEL AIRPLANE News, May, 1939) twin-engined Allison-powered fighter at a cost of \$2,180,728; thirteen Bell XP-39 (MODEL AIRPLANE News, current issue) tricycle Allison-powered pursuit at a cost of \$1,073,445. More orders promised immediately.

Jacqueline Cochran broke woman's altitude record for 985 cu. in. displ. ships with climb to 33,000 feet in green Beechcraft D-17S over swanky, desert-resort Palm Springs, California wearing Mayo oxygen mask from 15,000 feet up. Her dream: a leisurely six-months round-the-world flight.

Robert Kersten, Folsom (California) prisoner, invented variable-pitch prop which has been accepted by War Department for tests.

Seven Consolidated XPB2Y-2 four-engined flying boats for the Navy at a cost of \$4,699,057. Four Douglas DC-5, tricycle twin-motored 18-passenger airliner, for Chicago and Southern Airlines. Totals 24 orders on hand for craft featuring crew of three, 850 pounds of cargo, climb to 12,200 feet on one engine.

Captain Baron Rudolf von Moreau, famed German long-distance flyer, (Focke-Wulf "Condor") was killed while testing an experimental fighter near Berlin.

Ten Beechcraft D-17S, 5-place cabin photography biplane, for the Air Corps at a cost of \$528,749. Forty-eight Douglas (Santa Monica) B-23 twin-engine bombers for the Air Corps at a cost of \$3,960,000. Slim fuselage, tail gunner, double-row engines, enclosed retractable landing gear, hi-speed: better than 300 miles per hour!

Mysterious Kinner model GC-14, twin-row radial first guardedly exhibited at Los Angeles' Pan-Pacific Air Show three years ago, unveiled with a rating of 1050 horsepower at 2400 r.p.m. at 7,000 feet and 1200 horsepower for take-off. Douglas' monster XB-19 nears completion at Santa Monica Division. Power will be provided by six Wright "Twin Cyclones" of 2500 horsepower each.

"Mail-box" slots cut into leading edge wing-tip of all British (civil and military)

Lockheed 14 monoplanes to prevent stalling and wing-drop at low-speed.

Licensed production of Oerlikon-Hispano HS-404 25 mm. aero-canon at Grantham, England for recent Royal Air Force fighters.

American Airlines revenue up 32.4 percent over April of last year and 13.7 percent over last month for April, 1939.

Pan American Airways has been licensed by the Federal Government to use Canton Island (Mid-Pacific) as an air base for Hawaii-Australia-New Zealand routes now under development.

Five new combat squadrons and a transport unit to California Army Air bases: One heavy bombardment squadron each to Hamilton Field (San Rafael) and March Field (Riverside); three pursuit-fighter squadrons to Moffett Field (Sunnyvale); and one transport squadron to March Field.



A new "speed demon," the Grumman XF4F-2 Navy fighter. (Off. Photo U. S. Navy)

Eleven other new squadrons will be awarded to bases about the country by the G.H.Q. Air Force.

Frank W. Fuller in his Seversky Racer from San Francisco to Salt Lake City in 2 hours 9 minutes 44 seconds for the 628 miles distance.

Last of ten Douglas (El Segundo) 8-A-3P low-wing two-place attack ship, has completed the grueling 3500-mile flight to Peru under command of Major Armando Reveredo. The order for this export version of the popular A-17A (retractable landing gear) model amounted to \$500,000.

First of six "Hurricanes" for Royal Canadian Air Force base at Vancouver was destroyed on first take-off by unskilled Sergeant-pilot who lost control and dashed through the woods at 60 miles per hour. Plane was flaming wreckage; he escaped alive.

T.W.A. reorganization: President Jack Frye (at 35 America's youngest major airline head) assumed financial control through stock transaction; D. W. (Tommy) Tom-

linson to research and board of directors; and Otis F. (Million Mile) Bryon to chief pilot.

Edmund T. Allen, of test-pilot fame, has been employed as Boeing's chief of research; his first job: a thorough "going-over" of the Stratoliner design.

Curtiss-Wright's new reversible-pitch propeller is designed for seaplane taxiing use, as well as land-plane ground-run braking on short runways.

Edward P. Warner, pioneer aeronautician, to membership in the C.A.A. replacing Edward J. Noble, who is slated for an under-secretaryship in the Department of Commerce.

Long-fought, the Aeronautic Research Bill was passed awarding four million dollars to Sunnyvale, California, for the establishment of a huge research plant.

Off to South America went Lockheed's camouflaged model 212 light attack-bomber, twin-engine model 12 with front and rear-turret gun imitations. The tour will cover Central and South American countries in the interest of order-booking. Top speed: 220 miles per hour; climb: 1000 f.p.m.

Twenty "Hurricanes" (eight-gun British fighters) to Belgium Air Force with special motors and propellers; top speed: 326 miles per hour.

Authentic notes on the new Lockheed "Excalibur": Tri-cycle, 13-tons, 21 to 28 passengers, crew of three, all-metal, low wing, powered by four P&W Wasp single-row engines of 600 horsepower each, top speed: 241 miles per hour. Dimensions: span, 95 feet; length, 74 feet-2 inches. Range: 2500 miles. Take-off run: less than 1000 feet. Climb: 1200 feet per minute; absolute ceiling 24,000 feet. Ready in the Spring of 1940.

Canada will train 50 British Royal Air Force officers per year for the next three years due to crowded conditions at London flight training college.

Latest vulture: the XP-48 single-seat, ten-gun fighter; four in the wings, two in the nose, four firing rearward from the tail.

Laura Ingall's will attempt to shatter the world's non-stop distance record in her Barkley-Grow twin-engine monoplane, starting from some point in the middle-west. Take-off date will be immediately after final fuel consumption tests.

Douglas DC-6: smaller edition of the DC-4 with four engines, tricycle landing gear.

Col. Charles Lindbergh has been assigned a fast Curtiss P-36A fighter for his extensive nation-wide inspection of research and production facilities of aircraft establishments. Handles it like the veteran he is.

American Aircraft Company: successors to the Security group of Long Beach, California. Re-financed, small-plane production will begin soon.

(Continued on page 50)

MODEL CRAFT

RUBBER POWERED MODELS
THE WORLD OVER

**SEVERSKY P 35**

This ship is said to do over 300 m.p.h. Kit has turned cowl, hard wood prop, cement dope, trim color, and easy to follow plans. You will like this ship. Wing span 24 inches.

\$1.00

**NORTHPROP A 17**

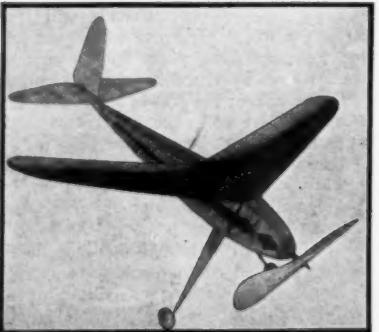
This high speed attack plane is known to all interested in planes. 24" accurate model. Detailed plans make building easy. Kit has turned cowl, cement dope, trim color, hard wood prop, and balsa.

Add 10c Postage \$1.00

**PACIFIC ACE**

A practical and durable commercial model. Easily constructed from well drawn and detailed plans. Kit contains an ample supply of first grade wood and high quality cement. Comparable with and out-flies most dollar kits. Add 10c for Postage.

40" Model, same ship . . . add 10c postage . . . 25c

**RECORD WRECKER**

Newest Modelcraft Sensation! With a 26" span the Record Wrecker includes freewheeling unit, rubber lube, contest rubber, best quality balsa, cement, dope and large full size plans. Add 10c for postage.

50c

MODEL CRAFT
7306 S. VERMONT AVE.
LOS ANGELES • CALIF.

The Bell XP-39 Pursuit Plane

(Continued from page 7)

ing fields cannot always be the most select of places."

Already plans are underway for rapid construction of more of these ships to fill the Air Corps order which did not reveal the number to be purchased. Within a short period, however, the pursuit groups of Uncle Sam will be reinforced with the "greatest little ships that engineers have so far produced."

Elements of Model Plane Radio Control

(Continued from page 12)

important. From it the constructor will be able to ascertain how many degrees the spark may be retarded and still retain reliable operation.

On the experimental motor it was found the spark could be set back about 10 to 13 degrees for "idling." The range was therefore made adjustable from about 5 to 25 degrees retard relative to the high speed points. The auxiliary points may be mounted directly on the motor frame and independent of the regular points, or the two can be mounted and moved together. The former is undoubtedly the best, as it allows independent control of each speed. However, it will be found more practical in some motors to fasten the auxiliary contacts right on the main breaker, this system being employed on the Brown Jr. shown in Fig. 2.

Details of the installation are shown in Fig. 3. This drawing is not to scale and the thickness of some of the parts has been exaggerated purposely to show hole locations.

Piece A is the regulation Brown Jr. contact point assembly, with the point itself indicated at B. Holes for the screws C-C are drilled in A. These screws are 2-56 flat head and may be 1/2" long. The metal around the holes in A should be forced outward from the inside so that the screw head will fit flush with the inside surface of A. Countersinking may be employed, but it thins the metal so that C is apt to be pulled through when the nut is tightened. Screws C-C are then soldered in place, preferably with Alumaweld solder, or any other kind that is stronger than the ordinary variety. Silver solder is not required, but something between it and ordinary "radio" solder in strength is advisable.

Next, piece I is bent from half hard brass at least 1/16" thick. It may be about 1/4" wide and is bent on a radius about 1/16" larger than that of A. I is slotted at each end for a length of 5/16" to 3/8", the slots being wide enough to fit over sleeve E.

Each screw, C, must have fitted to it a fibre sleeve, E, two fibre washers, D and F, and a lock washer and nut, G and H. D goes between A and I, E goes in the slot, and F outside of I, so that I is completely insulated from A and screws C-C. Any kind of insulation may be used for D, E, F, and in an emergency they could probably be made of tough cardboard with heavy paper for E.

Screw J is now soldered into I about 1/2" from the end. K is a contact point, which

may be taken from an auto ignition repair arm or from a radio jack or switch. It is soldered to I.

Piece M is also of brass and is fastened on screw J with a set of insulating washers similar to D-E-F. Another 2-56 screw, L, is soldered to it.

The contact arm, N, is made of any springy material with steel having the preference. If possible, this piece should be hardened at point, Q, where it bears on the cam. N is fastened to M directly, without insulation and the proper place to fasten the contact point, O, so that it meets K squarely must be marked. O is soldered in place on N, then N is bolted to M with the arm running between M and I.

The whole business may now be assembled to A, with the latter in place on the timer arm. Connections are made as in Fig. 1. T-1 and T-2 are the two sets of points, and the letters in circles correspond to the parts shown in Fig. 3. It may be seen that a condenser is used across each set of points. If all leads in the system are short, a single condenser may be connected from ground to the relay arm. However, during tests on this system, the receiver and relay were connected to the motor through several feet of wire, and condensers right at the points gave much superior results. One of these may be seen in Fig. 2 below the motor.

So much for actual connections. The only point remaining is to operate the newly installed contacts, and this naturally calls for a cam. The regular cam on a Brown Jr. is combined with the propeller hub, so to speak. In other words, the cam which is about 1/2" in diameter, is made integral with the rear "washer", against which the propeller is held. The washer part of this unit is about one inch in diameter and it is this that we use for the new cam. It is simply necessary to grind this flat for a depth about 1/16" in from the edge. Grind the whole circumference of this part smooth, so that it will not wear the arm, N, unduly.

The place to grind the new cam must of course be figured from the data obtained in the test runs at reduced speed. Using the main contact points as a reference, it may be seen that if the new points open at the same instant as do the main ones, there will be no change in motor speed. If, however, the auxiliary points open a bit after the main ones, the spark will be retarded and the motor will slow down. This same line of reasoning holds true for any other motor and timer arrangement. Whatever system is used, you can figure the number of degrees to set or grind the new cam from watching operation of the original or high speed timing points.

It may, of course, be possible on some motors, due to their particular construction, to use the same cam for both sets of points.

To get back to the Brown, after the cam has been properly ground and the points set to open about as far as do the main ones, the propeller may be installed. It will be necessary to put a washer between the prop and the cam so the former won't rub against the end of N. If metal turning equipment is available, a new rear prop washer could be turned. It should be roughened or serrated on both sides so the prop will not slip.

Considerable experimentation will be needed to find the right amount to retard the

HELLO FELLOWS:

I'M HEADED FOR THE NATIONALS AND HOPE ONE OF YOU WILL WIN THIS \$100.00 BILL. REMEMBER, YOU STILL HAVE TIME TO COMPLETE A MODELCRAFT SHIP BEFORE THE MEET.

Barney



FLY TOMORROW'S SHIP TO-DAY

Do you long for flying performance? Are you one of the army of model builders that is handicapped with a ship of antiquated design? Do you go out to fly and wind up on the side lines watching the other fellows? You can have a ship that will give first prize performance, flight after flight.

Watch the smiling Miss Tiny owner's flying at your local Model Airport. See your dealer to-day or order direct.

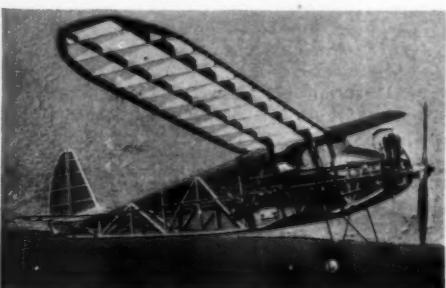
SPECIFICATIONS

A pocket edition of the Pacific Ace, 46" constant cord wing. For Ohlsson 23, Phantom and other $\frac{1}{2}$ " engines. Wing span, 46". Hi-Speed Deluxe Kit contains spun cowl, silk, $2\frac{1}{2}$ " Volt Air Wheels, cement dope, die-cut ribs, plenty of good balsa, and full size plans. Price **\$3.95**

Standard Kit same, but with bamboo paper covering **2.95**

Dry Kit complete except for wheels, covering, cement and dope **1.95**

Plans only **25c**



MISS TINY IS EASY TO BUILD

Cut-away photo of Miss Tiny, showing sturdy construction to withstand hard usage. Notice simplicity of design for ease of building. The new 20 second engine run contests (N.A.A. rules) are made to order for Miss Tiny, as proven by the winning of the first California open 20-second engine run contest held at Pomona March 5th, where Miss Tiny won 1st, 2nd, and 3rd places, flying against 260 ships of all sizes.

MODELCRAFT ENGINES BROWN



We carry a complete stock of Brown Motors and Parts.
Model "D" \$12.50 Post Paid
Model "C" \$18.50 Post Paid
Model "B" \$21.50 Post Paid
Model "M" \$16.50 Post Paid

OHLSSEN



GOLD SEAL
For that extra margin of performance
SPECIFICATIONS
Horsepower 1 1/2. Bore 7/16" Stroke 1 1/2" RPM 500 to 10,000 R.P.M.
\$18.50 Post Paid



MODEL "23"
Choke-full of power,
speed and stamina!
SPECIFICATIONS
Horsepower 1 1/2.
Bore 7/16" Stroke 1 1/2" Bare weight 4 1/2 lbs.
Height 3 9/16" \$18.50 Post Paid



HI-SPEED
1/7 H.P. 6800 R.P.M. Weight 3 1/2 oz. Run upright or inverted; fully assembled; complete with coil and condenser.
\$12.75 POSTPAID

THE MODELCRAFT AWARD! **\$100.00**

WILL BE AWARDED TO

the winner of the 1939 nationals providing he is flying a MODELCRAFT gas job. Be a winner! Buy a Modelcraft Kit and get in the Champion class. Start right now—send for our FREE Catalog of latest Gas and Rubber Models and Supplies.

NOTICE TO DEALERS

We will pay \$25.00 to the dealer who sells the winning Modelcraft Gas Kit in the 1939 Nationals.



1939 PACIFIC ACE WON 1st PLACE AT SAN DIEGO

With 1 hour and 5 minutes on a 30 second engine run. This was the winner's first ship and he finished it just in time to get in the contest. 66 in. tapered wing. De Luxe Kit contains tapered spars, beveled and tapered trailing edge, die-cut ribs, turned aluminum cowls, 1 qt. gas dope, 1 pt. cement, $3\frac{1}{2}$ yds. super silk, formed landing gear, $4\frac{1}{2}$ in. inflatable air wheels, dural wire, alum. tube, washers, bolts, haskalite, dural sheet, hook up wire, switch, selected hard balsa, full sized, black and white plans with test flight instructions, complete.

\$8.50

Standard Kit with bamboo paper, $\frac{1}{2}$ pt. of dope, 1 pt. of cement and $3\frac{1}{2}$ in. air wheels **\$6.25**

Dry Kit same as above without cement, dope, silk or wheels **\$4.75**

50c

★ MODELCRAFT ★
THE LEADING SUPPLY HOUSE OF THE WEST ★ 7306 SOUTH VERNON AVENUE, LOS ANGELES, CALIF.

A CLEAN SWEEP
at the world's biggest meet

CONTEST DIRECTOR NOTES BUNCH MOTOR RECORDS

1ST PLACE \$100.00 JOHN BUNCH 20 min. 20 sec.

3RD PLACE \$25.00 HOWARD BROUGHTON 13 min. 9 sec.

5TH PLACE 1st CHOICE Merchandise Award JIM WILLIAMS, SR. 12 min. 30 sec.

BUNCH MOTORS WIN BAKERSFIELD CONTEST APRIL, 1939 AGAINST 400 ENTRANTS

The world's most modern motors are winning NOW! There is a notable reason for this unexpected performance. It is an achievement of uniform, big industry manufacturing through Bunch developed methods. Backed by years of active, day-in and day-out experience Bunch Motors have been PROGRESSIVELY developed to set new standards of performance.

When you buy your next engine remember the self-styled champions of the past are not good enough. Bunch Motors, of modern construction, deliver that extra performance, needed stamina and rugged dependability that is winning to-day!

Frank Knaptan, leading N.A.A. official at all Pacific Coast meets says:

"The competition at the 1939 Bakersfield meet was the ACID TEST for champions! With all the experts striving to win the large cash prizes, competition was the keenest I've seen. The fast 8 official times above 10 minutes would win any other like contest."

Bunch Motors HAVE THAT something extra to outperform and win 3 leading places in the West's latest, greatest contest.

SPECIFICATIONS

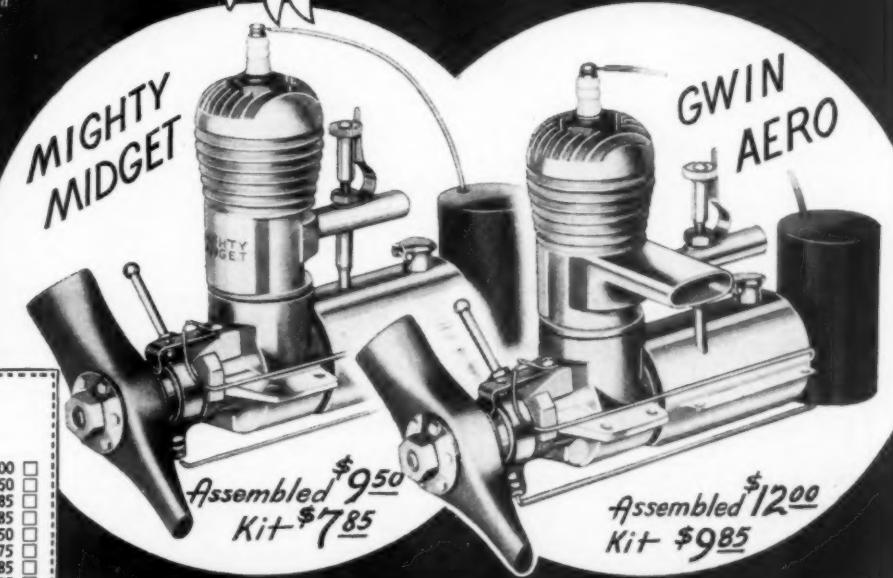
All Bunch Engines are piston ring equipped, H.P. 1/3 Bore 7/8 - Stroke 3 1/4 Displacement 45.100 cu. in. Assembled engines fully blocktested. Engine kits supplied with all bearings, piston and rings and timer fitted. Includes coil, tank, condenser.

START WINNING!

SEND FOR A BUNCH MOTOR TODAY! ★ CHECK AND MAIL

Gwin Aero Upright Assembled	\$12.00	<input type="checkbox"/>
Gwin Aero Inverted Assembled	12.50	<input type="checkbox"/>
Gwin Aero Upright Kit	9.85	<input type="checkbox"/>
Gwin Aero Inverted Kit	9.85	<input type="checkbox"/>
Mighty Midget Upright Assembled	9.50	<input type="checkbox"/>
Mighty Midget Inverted Assembled	9.75	<input type="checkbox"/>
Mighty Midget Upright Kit	7.85	<input type="checkbox"/>
Mighty Midget Inverted Kit	7.85	<input type="checkbox"/>
Mighty Marine Speedboat Engine	12.50	<input type="checkbox"/>
Mighty Marine Engine Kit	10.85	<input type="checkbox"/>

Name _____
Street _____
City _____ State _____



BUNCH

MODEL AIRPLANE CO.

5009 So. Hoover St. Los Angeles, Calif.

H. Stofer wins 1st place over 187 contestants at Dayton with Jr. Wing
DOUBLE YOUR FLYING!

SUPER-SENIOR \$14.50
 Plus 60c postage
 4½" Airwheels \$1.75
 Span 10 ft.
 Length 35". Wing
 area 12 sq. ft. Weight
 6 lbs. Use any ½ to
 ¾ H.P. Engine.

JUNIOR \$5.95
 Plus 25c postage
 3½" Airwheels \$1.50 add.
 Span 5 ft. Length 44".
 Wing area 5.57 sq. in. Weight 2 lbs. Use any
 engine up to ½ H.P.

MONOWHEEL LANDING GEAR optional on Senior and Super-Senior. Engines may be upright or inverted.

SENIOR \$6.95
 Plus 32c postage
 3½" Airwheels \$1.50
 55". Span 11 ft. Length
 55". Wing area 7.55 sq. in.
 Weight 3 lbs. Use any ½ to
 ¾ H.P. Engine.

WING PARTS
 Includes Left Wing Gear & a Plywood Fuselage
FOOTAGE PARTS
 Includes Tail Fin, Rudder, Tail Skid, Propeller, Motor, and Landing Gear
Other Parts
 Includes Fuel Tank, Carburetor, Spark Plug, Ignition Wire, and Other Components
Senior Kit Shown—Junior and Super-Senior Kits Are Similar

West of Rockies and Foreign—Double the postage on each model. 6 POINTS of CUSHION-CONSTRUCTION makes all landings smooth—practically eliminates "crackup" rebuilding (another reason for doubling your flying).

THESE ARE KORFF K-D KITS
(KNOCKDOWN) Cut Your Building Time in Half
 All parts are cut to size and are pre-painted, pre-drilled, and pre-sanded. Just lay them out and understand full size drawings and instructions. They are simplified for the beginner. A time-saver for the experienced.

7 OTHER OUTSTANDING FEATURES
Write For Literature

BUY A MODEL DESIGNED BY AN AERONAUTICAL ENGINEER
Prices and Specifications Subject to Change Without Notice.

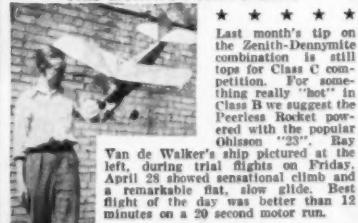
Now in our own NEW and LARGER location

KORFF INC. Corner Gov. & Columbia Sts., Evansville, Indiana

**MODEL SUPPLY HEADQUARTERS
 for the NORTHWEST**

We carry all the **BEST MOTORS, KITS and SUPPLIES** in stock for **SAME DAY** shipment. ORDER NOW!

GAS MODELERS!
 THIS MONTH'S 6-STAR SPECIAL



PEERLESS ROCKET, complete kit \$3.50

Flight Timer, 1 oz. \$2.00
 Gas props, 0° to 14° OHLSON
 25c and up.

All the New Gas Kits in Stock

Aircraft Zenith..... 5.50
 Comet Mercury..... 2.95
 Comet Zipper..... 3.95
 Berwick Cavalier..... 4.95
 "60"..... 4.95
 Scientific Mercury..... 4.95
 Megow Ace..... 4.95
 Megow Commander..... 4.95
 Miss Tiny..... 2.95
 1939 Pacific Ace..... 6.25

ENDURANCE TYPE RUBBER MODELS

Build and fly by the famous DICK KORDA

Now \$1.00 now only 39c

Add 11c per kit for packing and postage.

Brown contest rubber for Korda propellers. Special Korda propeller blank 30c

Burd Thermalder kit 50c

Orders for \$1.00 or more shipped postpaid **SAME DAY**.

We can fill your order for any kits or supplies advertised by Peerless, Comet, Megow, Burd, Berkley, Denny, Aircraft, Scientific, Ohlson, Modicraft.

DEALERS: We distribute all the above lines. Write on your letterhead for our attractive proposition.

BILLETT'S
 MODEL AIRCRAFT DISTRIBUTORS
 2548 Nicollet Ave., Minneapolis, Minn.

The fuselage is of all-metal monocoque construction with flush riveted covering to cut down parasite drag, a feature also incorporated in the wing. The forward section of the fuselage is made up of transparent panels, allowing maximum visibility for the crew; the pilot being located in such a manner as to provide vision in all directions without interference from engine nacelles. Installations are provided for an unusually large number of fixed and flexible machine guns and a large bomb load of assorted types is carried internally.

It is the only airplane of the three to boast of a tricycle landing gear, which retracts into the fuselage and nacelles by hydraulic controls.

The NA-40: Wingspread, 66 ft.; Overall Length, 48 ft., 10 in.; Gross Weight, 18,000 pounds; Crew . . . three or four.

The North American ship has been designed to combine the desirable features of the attack plane with those of the light bomber, having high performance near the ground as well as at altitude. Still another important feature of the NA-40 is that it has been designed for fast and large scale production, for which North American is now famous.

Nearly having concluded all tests at Dayton the swift airplane met misfortune while flying very low during an attack maneuver. It is said that when engine trouble occurred the pilot decided to make a forced landing in a field, with the wheels up. All three of the crew escaped serious injury but on landing apparently the sudden jar forced a leak in the fuel

compartment and the ship burned to destruction. The crash was not due to faulty design, and since the tests were practically complete, North American is still likely to receive an order for some of NA-40 type.

The Stearman entry is something still different and does not catch one's eye as being very graceful, though its performance may be up to par. The bulging nose is most definitely a glass house, apparently one to end all glass houses. From the very tip of the nose, where is located the bombardier and gunner compartment, to the rear of the pilot seat the entire enclosure is glass enclosed, and there is no break in contour for windshield. However, it is said that the pilot has sufficient visibility. The aft part of the fuselage has rather square lines with provisions for machine guns on top, bottom and both sides. The landing gear is conventional and is electrically operated. Even the tail wheel retracts.

Known as the X-100, it was test flown by the noted Edmund T. Allen and Deed Levy, Stearman test pilots. Though the test ship that was sent to Dayton had Pratt & Whitney "R-2180" engines, additional bids were submitted on the plane equipped with the "2600" and "2800" engines manufactured by Pratt & Whitney. The very maximum horsepower obtainable from the standard "R-2180" engine is said to be 1,400 hp., while the "2600" is 1600 hp. and rated at 1350 hp. Most high horsepower engines are only permitted to be run at maximum horsepower for a duration of about five minutes. Thus the maximum horsepower is used only for emergency purposes such as when the plane is in combat or during take-offs.

Flush rivets are used throughout the wing and fuselage. Full-feathering, constant speed, three-bladed propellers and flaps are other features.

The Stearman X-100: Wingspread, 65 ft.; Overall Length, 52 ft.; Height, 12 ft.; Gross Weight, 18,000 lb.; Crew, four.

The Glenn L. Martin entry, of which 115 have already been ordered by France with an additional 100 as good as sold to the same country, is said to be equipped with only the P & W "1830" engines. Comparing prices submitted by the companies and released by the Air Corps, we have the following:

In Lots of: 50	100	200	2,000
Stearman	\$102,087	84,477	75,823
North American	91,220	68,500	64,380
Martin	92,970	81,600	74,600
			51,000
			56,000

Douglas and Vultee ran a little competition of their own also, and this was for single-engined attack ships. Following is the dope revealed by the Air Corps:

In Lots of: 50	100	200	1,000
Douglas	\$35,160	31,625	28,580
Vultee	38,750	32,100	28,940
			22,400
			26,410

Prices are per airplane fully equipped. It is rumored that Douglas has considered an Allison engine in one of their single-engined attack proposals.

The month of July will be the month when new designs will make their appearance thick and fast. The Army Air Corps has advertised for bids for designs on the following types of planes, and they are all due at Dayton in July: Light Primary Training, (Perhaps Civilian Primary Training), Basic Training, Advanced

Training, Observation, Two-engined Bombardment, Four-engined Bombardment, Multi-place Fighters, Twin-engined Interceptor Pursuits and Single-engined Interceptor Pursuits.

No doubt we will see something new in the way of military aircraft. Something unusual is the fact that Stinson reports it will enter an observation plane of advanced design for competition. We hear that Grumman is working on a Navy twin-engined job, Vultee, a single-engined interceptor pursuit and a basic combat ship. Lycoming admits it is developing a large liquid-cooled engine!

At approximately the same time that the Navy gave Brewster an order amounting to over \$300,000 for new ships, another order was received by the company: A unique one for two radio-controlled airplanes placed by the W. L. Maxson Corp. who will use them for experimental purposes. Details of the Brewsters have not been disclosed as yet.

To Europe where all the war fuss is going on we have been keeping an eye cocked for new warplanes to come out in the open air. As yet we have not caught anything that would be adaptable to these columns. . . . BUT when the new creations do start popping out they will come in vast numbers. Therefore in the near future be prepared to see in these columns news and plans of latest designs in European war craft. There should be something very, very worthwhile.

Backing up our statements of several months ago that the Heinkel single-seat pursuit should be able to break the Messeschmitt's world speed record, a German aviator, Capt. Hans Dieterle, claims he not only has broken the record but also the absolute speed record in the Heinkel! He is recently reported as having done 463.9 m.p.h. over a measured three-kilometer test course on March 31 in a Heinkel single-seat pursuit powered by a 1175 hp. Mercedes-Benz engine.

In the East is Benny Howard spending his time developing a large transport whose tail swings to one side for loading and unloading the fuselage. In the West is another famous person, Charles Babb, noted international used plane broker, who is developing two new designs with swinging noses.

Like Benny's ship they will be twin-engine, high-wing monoplanes with tricycle landing gear, and in the ceiling of the fuselage will be a monorail hoist for loading heavy cargo. The pilot sits well on top of the fuselage in a small enclosure away from all the loading confusion. Gross weight of the airplane is 15,000 pounds. Construction is of steel tubing with fabric covering. The second design will be twice the size of the first and will probably be of monocoque, all-metal construction. The span of the first will be 80 feet.

Here is some more advance information on forthcoming Lockheed aircraft. The Lockheed "Excalibur": Number of engines, four; Number of passengers, 21-28; Gross Weight, 25,000 lb.-30,000 lb.

A development of the Lockheed Electra is under way. It will have larger engines, better performance and carry 12 passengers.

MIGHTY MIDGET

GASOLINE ENGINE

ONLY

\$9.50

POSTPAID

Complete, Ready to Run. Including a Tru-Pitch Prop., oil, instructive manual and double guarantee.



SPECIFICATIONS:
All Engines full 1/5 h.p. 8500 r.p.m.; Bore 7/8"; Stroke 13/16"; Bare Weight 6 1/2 oz. Complete, ready to run, with coil, condenser, fuel tank, Champion spark plug, etc.

OTHER BUNCH MOTORS

MIGHTY-MIDGET Upright Kit.....	\$ 7.85
MIGHTY-MIDGET Inverted Assembled.....	9.75
MIGHTY-MIDGET Inverted Kit.....	8.85
GWIN-AERO Upright Assembled.....	12.00
GWIN-AERO Upright Kit.....	9.85
GWIN-AERO Invert. Assembled.....	10.80
GWIN-AERO Invert. Kit.....	9.85
MIGHTY MARINE Assembled.....	12.50
MIGHTY MARINE Kit.....	10.85

All prices are postpaid

"B" made gasoline engines for model planes. Small sizes, cylinder and piston individually fitted make Model "B" truly a precision unit. Fully transparent, unbreakable fuel tank. Cadmium plated. Assembled on \$21.50 skids ready for operation.

The last word in precision-made gasoline engines for model planes. Small sizes, cylinder and piston individually fitted make Model "B" truly a precision unit. Fully transparent, unbreakable fuel tank. Cadmium plated. Assembled on \$21.50 skids ready for operation.

Identical in every respect to the model "B" except for aluminum piston and special rings. The new Gwin-Aero and other 1939 Brown Motors give positive contact at the nodding point. Motor can be rotated from 180 degrees to 360 degrees to get it in any position.

18.50 p.p.
The latest power unit for model cars and marine use. Includes Aluminum piston and special rings, combination flywheel and cam washer for high speeds on open \$16.50 p.p. hulls.

MODEL
"D"



New 1939 Brown Jr. Engines

More value for your money! Precision-made in the world's largest and most completely equipped plant devoted to the manufacture of gas model motors. The Model "D" includes the latest engineering advances used in other Brown Junior Motors. New and improved timer! New Chrome Molybdenum Crankshaft! Model "D" features a Valve! New transparent fuel tank! Motor shipped ready-to-run, complete with coil and condenser... \$12.50 p.p.

10 DAY TRIAL Order your Brown Jr. now. If within 10 days it fails to give complete satisfaction return it immediately and the full price will be refunded to you.

ALL MOTORS INCLUDE SPARK PLUG, COIL, CONDENSER, FACTORY BUILT AND TESTED AND SCIENTIFIC DOUBLE GUARANTEE. Bore 7/8"; Stroke 1 1/16"; Weight (bare) 6 1/2 OZES.



"B" made gasoline engines for model planes. Small sizes, cylinder and piston individually fitted make Model "B" truly a precision unit. Fully transparent, unbreakable fuel tank. Cadmium plated. Assembled on \$21.50 skids ready for operation.

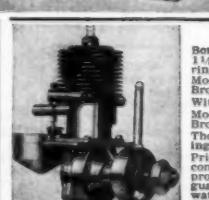
Identical in every respect to the model "B" except for aluminum piston and special rings. The new Gwin-Aero and other 1939 Brown Motors give positive contact at the nodding point. Motor can be rotated from 180 degrees to 360 degrees to get it in any position.

18.50 p.p.
The latest power unit for model cars and marine use. Includes Aluminum piston and special rings, combination flywheel and cam washer for high speeds on open \$16.50 p.p. hulls.

HUSKY JUNIOR BRAT ENGINE

Bore 9/16" Stroke 5/8" Height on centerline. Weight 8 1/2 oz. With coil, condenser, plug, propeller, instructions, oil and double guarantees, postpaid. \$12.50

Bore 9/16" Stroke 5/8" Height on centerline. Weight 8 1/2 oz. With coil, condenser, plug, propeller, instructions, oil and double guarantees, postpaid. \$16.50 Postpaid



Förster Bros.

Bore 1 1/16" stroke 1 1/8" 1 1/2 H.P. 2 piston motor. Weight 10 oz. Model "B", Air cooled. Bronze bearing....\$17.75 With Ball Bearing....\$19.80 Model "W", Water cooled. Bronze Bearing....\$17.75 The same with Ball Bearing....\$19.80 Prices are postpaid for complete engine including propeller, oil and double guarantees (no prop. with the following motors: Fly-wheels....\$1.00

1939 "O.K." MOTORS

Bore .900"; stroke 1 1/32"; S.M. 10,000; H.P. 1/5 p.p. Weight, bare 7 1/2 oz. Weight incl. plug, 4 11/16" Displacement, .618-10 c.c. Factory tested and guaranteed. All motors complete with coil, condenser, etc., ready to run.



Bore .900"; stroke 1 1/32" s.m. 10,000; H.P. 1/5 p.p. Weight, bare 7 1/2 oz. Weight incl. plug, 4 11/16" Displacement, .618-10 c.c. Factory tested and guaranteed. All motors complete with coil, condenser, etc., ready to run.

\$16.50 Postpaid

SCIENTIFIC MODEL AIRPLANE COMPANY
218-220 MA-7 MARKET ST., NEWARK, N.J.

ONLY 30 MINUTES FROM WORLD'S FAIR! VISIT OUR SHOWROOM

"ORIOLE" CONTEST ENDURANCE MODEL

Flies 2 to 3 Miles; Overall Length 34"

So simple, even the beginner can complete the model in a day. This Model will clear the ground in a short take-off and climb with amazing speed. Every detail of the "Oriole" conforms with N. A. A. contest requirements.

Kit is 100% complete. Black and Orange color motif. All highest quality parts—strip balsa accurately cut to size; ribs, outlines, etc. clearly printed on sheet balsa; formed wire parts, 16" machine cut drilled balsa propeller, cement, rubber, colored tissue, ball bearing washer, spring steel landing gear wire, pair of streamlined wheels, liquids, full size plans with instructions.

THE BIGGEST KIT VALUE IN AMERICA TODAY.

WINGSPAN ONLY \$1.00

POSTPAID OR AT YOUR DEALER

J-I-T-T-E-R-B-U-G ENDURANCE MODEL

25" Wingspan—Length 20 1/2"—Light Weight

FLIES OVER 1 MILE (6,000 feet)

Here's another famous Flying Model originated and designed by Scientific. This trim and玲珑的模型可以飞得高或慢速地滑翔。它可以在离地仅数英尺处起落，然后渐渐地升到一个完美的三点着陆！它是世界上最敏捷的飞机，你将永远建造！

该模型具有令人难以置信的优雅、流畅的线条和那令人惊叹的、经过深思熟虑的外表，简直可以说“流线”和长途飞行。

该模型非常容易建造，任何人都可以轻松地建造，即使没有经验。该模型完全包含所有材料，包括流线型轮子和现成的螺旋桨。包含完整的尺寸图纸和详细的说明。

Priced exceptionally low. Complete kit. Only 50¢

Postpaid or at your dealer

HILL OF GAS MODEL FLIGHT

YANKEE SOUND LIKE GAS MODELS

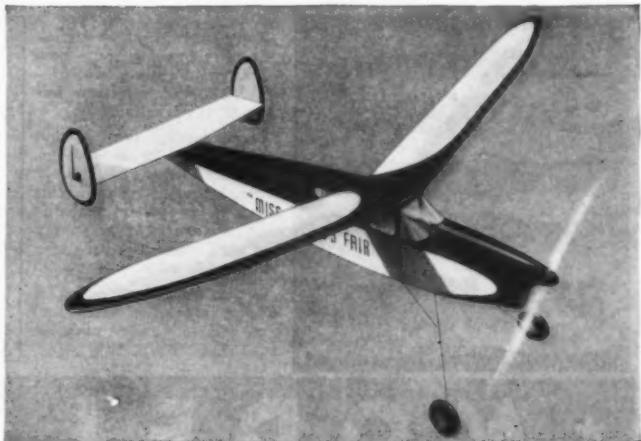


\$1.95
including
a pair of
H & M
precision
rubber
wheels

MODEL AIRPLANE CO.
"MODEL HEADQUARTERS"
NEWARK, N. J.

In Finland: O-Y Wiklund, Turku, Also
In Portugal: Ed Von Hale, Rua Dr. Miguel Bombarda, 243, Porto

"MISS WORLD'S FAIR"



FLIES 1 MILE

**50" WING SPAN
LENGTH 35 1/2"**

Weight 6 to 8 ozs.

\$1.50
**POSTPAID
OR AT YOUR
DEALER**



Here's as keen a model as you'll ever see. Notice the snappy lines, the well-designed fuselage with slanted windshield and enclosed cabin, its rakish sweep back wing, the distinguishing shape of its inverted type nose with open radiator, and the graceful twin rudders that are characteristic of present-day speed transports.

And Boy! how she can fly! The model runs along the ground for about 5 feet—then as gracefully as a gull, its wing lifts the model gently into the air. It climbs rapidly and gains an altitude of several hundred feet in little time all the while spiraling in large circles the diameter of a city block.

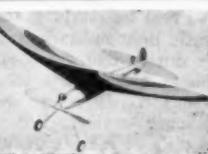
After the rubber motor is entirely unwound the model goes into a beautiful glide which can only be described as sensational. On one flight the model glided for over 2 miles, after which time it came in for a perfect 3 point landing.

If you're a beginner, you'll surprise yourself with the striking and unusual model you can build so easily from this complete kit. And if you're an expert, you'll find the "Miss World's Fair," a model that's worthy of your best efforts.

Here's the model that will make them sit up and take notice when you enter it in the next flying contest. ORDER YOUR KIT NOW.

KIT IS 100% COMPLETE with 16" machine cut balsa, center drilled propeller; ball bearing washer; all flat parts—ribs, bulkheads, etc., clearly printed on sheet balsa; tissue; formed wire parts; streamline wood wheels; liberal quantities of cement and paper adhesive; celluloid for windows; approximately 30 feet of finest quality brown contest rubber; washers; nose plug; celluloid, etc., etc.

In addition every kit contains a set of the clear, full size plans and detailed directions that have made so many friends for Scientific models among beginners and experts alike. A sensational buy at \$1.50, postpaid. SEE IT AT YOUR DEALER.



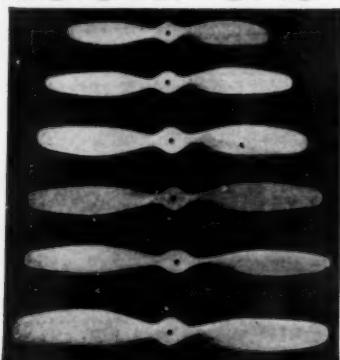
VALKYRIE Wingspan 24'
Length 18'
Flies 1/2 mile

GAS TYPE RUBBER POWERED MODEL
Designed by Indoor Expert Carl Goldberg in miniature duplicate of his prize winning original which won second place at the "National," Detroit, 1937. Can be easily constructed in 4 or 5 hours. HAS ALWAYS SOLD FOR \$1.00.

**NOW ONLY
50¢**

**Postpaid or at
Your Dealer**

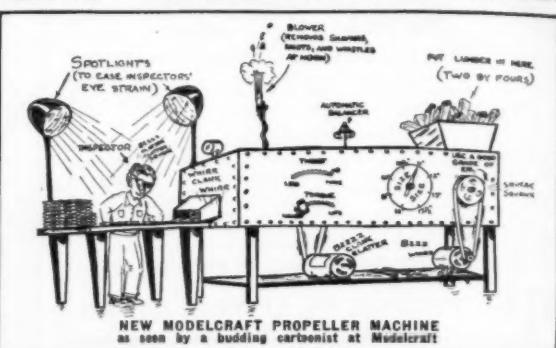
LOOK! GAS MODEL PROPS • 25c EACH ANY SIZE!



In answer to numerous inquiries regarding our new propeller machine, we present this sketch by our humorous staff artist.

Mechanically perfect and designed for 20 second engine run contests, it is only through the invention of this amazing propeller machine that we are able to supply you with these superior props at only 25c each.

Stock up now, carry a dozen extras in your tool box, complete range of sizes, 9", 11", 12", 13", 13½", 14".



★ MODEL CRAFT ★

THE LEADING SUPPLY HOUSE OF THE WEST ★ 7306 SOUTH VERNON AVENUE, LOS ANGELES, CALIF.

THE ONLY RACER WITH ALL THESE FEATURES

SPEED

✓ Wasp will match speed with any stock job of any size. Pick your own power plant—Phantom, Hi-Speed, Ohisson, Trojan, etc.—soup it up—the sky's the limit with the rugged Wasp chassis.

LOOKS

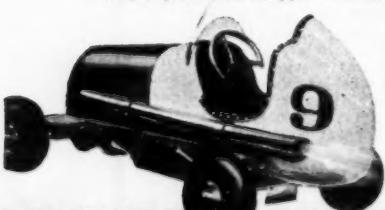
✓ Wasp is that different car. It's the only midget type—a close duplicate of Pat Cunningham's famous No. 9.

SIMPLICITY

✓ You can build the Wasp in 2 evenings. Rear axle prefabricated—front wheel friction drive with machined clutch plate and fly wheel and fully counterbalanced 2½" tires and wheels supplied. Body parts semi-finished—all holes drilled. Complete instructions and plans.

PRICE

✓ This is the BIG news—you can buy this complete 14" overall kit for only \$11.75. Or you can get the Wasp kit with Phantom race car engine complete with coil, tank, condenser and fly wheel for \$19.50—for a limited time only. All orders shipped at once.



Wasp Model Supply,
4128 Wade Avenue, Venice, Calif.

- Please rush prepaid one complete WASP SPECIAL race car kit as advertised, for which I enclose Money Order for \$11.75.
- Send Wasp Special Kit complete with Phantom engine and coil, tank, condenser and fly wheel at \$19.50.
- Send me full scale plans for Wasp Special race car. Enclosed is \$1.00 Money Order which will be deducted from complete kit price if I order kit within 60 days. California buyers add 3% Sales Tax. M7

Name _____

Address _____

Lockheed has now gone into slots, and they are incorporated as standard equipment on all Model "14" transports! Situated slightly aft of the leading edge are several openings to let air from the bottom of the wing to the upper surface. These are located only at the tips and reduce the possibilities of tip stalling. They are very similar to Col. Clark's bakelite-constructed Fairchild that is still under test.

The new Vega with Unitwin powerplant now about to take its maiden hop will be known as the "Starliner."

The Stinson "105" three-place sportplane will sell for \$2995.00! It is powered by a 75 hp. A-75 Continental engine with hydraulic tappets, dual ignition, mica spark plugs, altitude adjustment, carburetor heater, automatic valve lubrication and 6 volt spill-proof battery. NACA balanced type flaps and fixed slots are provided. An 18 gallon wing tank gives four hours cruising with gas consumption at 4½ gallons per hour. Range is 420 miles. A new feature is that the oil compartment is built integral with the engine; there being no oil tank.

First news on forthcoming ships for the 1939 National Air Races is that Marion McKeen is having his "Miss Los Angeles" rebuilt. The aft part of the fuselage will be elliptical in cross-section with no turtle deck for headrest as formerly. A new tail has been built, and the wing will be full cantilever as last year, housing the full retracted landing gear.

Douglas is planning a new four-engined transport that is an intermediate size between the DC-3 and DC-4. They have taken on a very large number of engineers to go full blast into those design competitions closing in July.

From Fairchild comes a very excellent little light military trainer that no doubt is out to win the obvious huge training plane orders that the government will sponsor. It is a low-wing ship with Ranger engine. We promise you more details of it next month.

The Physics of the Airplane

(Continued from page 16)

from a strain when the stress is removed is termed "elasticity."

Wood airplane members are particularly favorable in this respect. The return to original dimensions and shape of metal members is practically perfect unless they have been loaded beyond their elastic limit. This limit is represented by the value of stress beyond which the material yields and becomes incapable of recovering its original form or volume.

When the limit of elasticity is exceeded the metal begins to stretch rapidly even if the stress is somewhat decreased. This stage is termed the "yielding point." Chrome molybdenum, a typical aircraft metal, has a yield point of 60,000 pounds per square inch and has an ultimate tensile strength of 96,000 pounds per square inch.

Extensive laboratory experimentation has proven that structural members are bent and stretched in an amount which is proportional to the loads which are applied, or, to employ engineering terminology, strains are proportional to the stresses producing them. This law assumes, as above, that the material is not stressed beyond its elastic limit, and may be expressed as an equation:

$$\text{Modulus of Elasticity} = \frac{\text{Stress}}{\text{Strain}}$$

The values of the modulus of elasticity for various forms of airplane construction materials are given below:

Material	Modulus of Elasticity
Mild Steel	28,000,000
Chrome-molybdenum Steel	30,000,000
Duralumin	10,000,000
Ash	1,450,000
Spruce	1,300,000

Airplane wing spars represent extremely important structural members in view of the fact that they support the entire airplane structure during flight. Their length or span is necessarily great since considerable surface area is required to

generate sufficient lifting force to overcome the weight represented by the normally loaded airplane. The structural considerations involved become even more severe with the modern cantilever structures which entirely eliminate external bracing members. Wing spars, or beams, as we may call them, are subjected to the bending due to the air load which is distributed along their span. In addition, secondary loads are also imposed upon them; namely, compression emanating from the pull of the flying and landing wires, and torsion (twisting) resulting from violent flight maneuvers. As a consequence, wing spars must possess a high value of stiffness and at the same time exhibit a minimum of weight. The amount of bending or deflection has been found by experiment to be a function of the length, breadth and depth of the beam involved for a given loading. This relation may be put in equation form:

$$\text{Stiffness Factor} = \frac{\text{Breadth} \times (\text{Depth})^3}{\text{Length}^3}$$

As an example, let us calculate the stiffness factor of a solid rectangular airplane wing spar which is 20 feet long, 2 inches wide and 4 inches deep.

$$\text{Stiffness Factor} = \frac{\text{Breadth} \times (\text{Depth})^3}{\text{Length}^3}$$

$$= \frac{2 \times (4)^3}{(12 \times 20)^3} = \frac{2 \times 64}{13,824,000} = \frac{12.8}{13,824,000} = 0.00000925$$

If we consider two airplane wing spars side by side, the greater strength is not necessarily possessed by the stiffer of the two. Or, in other words, the mere consideration of the bending of a beam does not represent a true criterion of its strength. The dimensions do, however, influence the strength of the member as the following relation indicates:

$$\text{Strength Factor} = \frac{\text{Breadth} \times (\text{Depth})^3}{\text{Length}}$$

For instance, calculate the comparative ratio of the strengths of two airplane wing spars. The first has a length of 18 feet, a width of 2½ inches and a depth of 4 inches. The second has a length of 20 feet, a width of 2 inches and a depth of 6 inches.

$$\frac{\text{Strength of 1st beam}}{\text{Strength of 2nd beam}} = \frac{\frac{21/4 \times (4)^3}{(18)}}{\frac{2 \times (6)^3}{(20)}} =$$

$$\frac{36}{72} = \frac{36}{18} \times \frac{20}{72} = \frac{5}{9}$$

Note: The larger of the wing spars has a strength slightly less than twice that of the smaller member.

The foregoing factors are carefully considered by aeronautical engineers and designers prior to laying out the cross sectional shape of airplane wing spars. We have seen that both the strength and the stiffness are proportional to the breadth. However, the stiffness increases as the cube of the depth and the strength increases as the square of the depth. Consequently, in order that both the strength and the stiffness will possess the highest possible values, the depth should be as great as structural limitations will permit.



Meet the New Champion

SCIENTIFIC.... Announces the new "MERCURY"

HIGH CLIMB GAS MODEL

SPECIFICATIONS: Wingspan 6 feet, overall length 52", total weight, with motor and ignition units: 2½ lbs.

CLIMBS AT RATE OF 1,000 FEET PER MINUTE

THIS new Scientific Gas Model has many distinctive features that you would only expect to find in kits selling at much higher prices. The complete model is light, weighing only 2½ pounds ready to fly, yet by applying regular aircraft construction it is as strong as ships weighing 4 to 5 pounds.

The flying qualities of this model are far in excess of anything you might expect. Its light weight puts it in the air with a very short run, even with the motor running at half speed. Its stability is amazing, recovering rapidly from any position in which a steep climb or gust of wind may put it. It glides in long and flat, hovering about six inches off the ground for 20 feet or more, then gradually settling to the ground in an easy, smooth, three point landing.

The "MERCURY" offers you the "tops" in gas models at a very low price.

KIT IS COMPLETE with all necessary materials including: a pair of 3½" streamline balsa wheels; shaped prop. blank; all hardware parts; ignition wire; cement; bamboo paper; giant full size plan with instructions, etc., etc.

DE LUXE KIT: Complete as above, plus the addition of yellow, blue, and gold Scientific Deco and a pair of 3½" pneumatic Rubber Wheels (in place of balsa). A \$1.00 value for only

POSTPAID OR AT YOUR DEALER

\$4.95
less motor
POSTPAID, OR
AT YOUR DEALER

\$6.95
(less motor)

SCIENTIFIC MODEL AIRPLANE CO.
218-220 MARKET ST., DEPT. MA-7 NEWARK, N.J.

MERCURY

Here's an actual picture story of the "Mercury's" test flight at Paterson, N.J., on March 5.

And the "Mercury's" off like a flash, after a short run, climbing at the amazing rate of over 1,000 feet a minute.

After 15 seconds, the motor shuts off, the model rapidly recovers from its steep climb, going into a beautiful long flat glide.

Now the "Mercury's" coming in perfectly poised for a 3-point landing. A perfect flight!

This form of construction is incorporated in the "I-Beam" section which is very widely employed for airplane wing spars. By reference to Figure One we see that the central column or web possesses great depth in proportion to the flanges at either extremity of the member. These flanges are attached to the web for the express purpose of resisting shear which we have seen to be the tendency of the upper portion of a structural member to slide over its lower portion because of the applied side loads. Two I-Beams jointed by a common system of wide flanges becomes a "box" spar. Both wood and metal airplane structural components use these sections.

From our elementary discussion of the comparative strengths of airplane con-

struction materials, it becomes apparent that an enormous task confronts the airplane designer. Not only must his product be aerodynamically correct so as to perform well in flight and respond readily to all flight maneuvers, but it must combine a reasonable degree of lightness with great rigidity and stiffness as well as strength.

The process of incorporating the previously mentioned factors into the design is known in engineering circles as "stress analysis." Three accepted methods of airplane stress analysis exist at the present time. They are the graphic method, the trigonometric method and the algebraic method. The graphic method consists in representing the quantities involved by means of corresponding lines

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THE NEW
MERCURY
GAS MODEL BY SCIENTIFIC
See Page 37

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5 ft. MISTER MULLIGAN
5 ft. MONOCOUPE 90A
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vator, and metallic blue fuselage and rudder.

Propeller

Two of the factors that go into the design of a propeller are the size of the ship and the power used. Due to the large size of the "Dolfin" it is obvious that a large propeller must be used. A 16" diameter propeller is recommended. Extreme care must be used in the carving process as nothing can ruin the flyability of a plane as an inefficient propeller. If the reader is interested in the correct design of the gas model propeller, it is recommended that he read the articles by Mr. Grant on this subject.

Flying

The first flight should be made on a calm evening in a large field. Turn the rudder tab about five degrees to the right. The motor should have three degrees down and two degrees right thrust. This should make the plane fly in a 100 foot circle. If the first flight is satisfactory, gradually increase the power, making sure that the spiral is not too tight.

If there are any inquiries, they should be addressed to T. Petrides, c/o MODEL AIRPLANE NEWS, 551 Fifth Ave., New York, N.Y.

The Indoor Cabin Nationals Winner

(Continued from page 15)

stick. Also the same size rubber may be used with only a slightly smaller propeller to overcome the added drag of the fuselage and landing gear.

The points discussed seem to be borne out by the performance of this model to date. At the 1938 National Meet this ship established a new Open Class record with a flight of 16', 01"; the best cabin time of the day by more than two minutes. Later flown in a New York armory it set a local mark of 12', 15" under a sixty foot ceiling.

Material

Very little material is needed to build an indoor model, but only the best grade of light, firm balsa, generally referred to as "indoor wood" should be used.

8 strips 3/64" square
1 sheet 1/64" x 1-1/8" x 6"
1 sheet 1/32" x 1-1/8" x 6"
1 sheet 1/16" x 1-1/8" x 18"

These sheets should have a white, straight-grained appearance.

1 sheet 1/32" x 2" x 12"

This sheet should have a speckled appearance (quarter-grained).

1 prop block 1-1/8" x 3-1/2" x 7-1/2", or a machine-cut prop blank with a pitch diameter ratio of two.

.014 piano wire.

1 sheet superfine tissue 4" x 12"

4 small, brass indoor washers

1/2 oz. cement

1/2 oz. microfilm solution

Various grades of sandpaper, down to ten nought.

Fuselage

Plate I is drawn 1/4 actual size and fully dimensioned. Full size templates may be found on Plate II. A table of weights is given on Plate I against which the indi-

of the tail mount over the two 1/4" sheet pieces. The mount is internally braced with strips of 1/8" by 1/4" glued at the intervals shown. The hooks holding the mount in place on the body are bent from clothes-hanger wire. Similar hooks may be attached to the front and rear of the wing mount. These hooks accommodate rubber strands brought around under the body. The sides of the tail mount are of 1/8" medium sheet balsa and the upper curve conforms to the bottom curve of the elevator. The tail is glued on to this mount.

In planking the body obtain about 80 strips of 1/4" x 1/2" soft balsa. To start, glue one continuous strip over each of the four stringers. The second strips are glued adjacent to the side strips. The planking is worked from the sides toward the top and bottom. This method is adequately shown in the diagram illustrating the planking process. When all the strips are in place and dry, they are sanded down with a large sandpaper block, using first rough grades and then working down to ten nought. Always sand with the grain.

Cover the fuselage with silk in strips. Attach a small area at a time, using thinned cement and rubbing continuously with the fingers to work out any possible bubbles. After the job is complete, give the body three coats of wood filler, sanding between each coat with ten nought.

The wing and tail are now covered with silk. Apply at least three coats of clear dope.

The whole ship may now be painted. The original colors were orange wing and ele-



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Rubber Powered—
30" Wingspan
The
"BUCCANEER"



**\$1.00
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WITH BALL BEARING PROP SHAFT
Balsa Covered Wing—"Semi-Planked"
Fuselage Wire "Gas Model Type" Landing
Gear

No airplane in the history of model building has established such a long line of records equal to that of the "BUCCANEER" Gas Models, holder of both the Senior and Open World's Record under both limited fuel allowance and limited engine run rules. In response to your demands we give you the rubber-powered "Buccaneer." Designed for a 4-cylinder Menasco engine to give scale model appearance.

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"BUCCANEER-STANDARD"

12-Foot Wingspan. FOR 1/2 h.p. motor.
Limited Edition—rare combination of speed & A.A.A.-
Record Holder. Everything you desire in a gas model.
Beautiful lines, snappy performance, and priced with
the lowest mass production kits.

THE OHLSSON "23"

1/7 Horsepower
5/8" Bore x 3/4" Stroke
The engine that powered the "Buccaneer" to the
St. Louis Air Show and the St. Louis Cham-
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NEW RUBBER POWERED SEAPLANES! THREE-
VIEW DRAWINGS!
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For 1/5 H.P. MOTOR—Weighs 2 lb. 6 oz. complete

Here is Berkeley's latest design. A ship that is really different. With standard ignition she weighs only 2 lbs. 6 oz. Use 1 1/2 volt ignition and she will top the scales at slightly over 2 lbs. Its high-aspect ratio wing with 4 sq. ft. of area gives it a spectacular climb and a perfect glide. Actually requires less than a 3-foot take-off run!

Kit is complete, with full-size plans, special instructions, printed wood, hardware, etc., of the same quality as in all our higher price kits.

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AT THE 1939 NATIONALS

Another National is here! We are proud of our last year's record. Remember BERKELEY designed models finished 2nd, 4th, 5th and 9th. In 1939 BERKELEY offers \$25.00 in cash to the entrant who makes the highest average time flying a model built from a BERKELEY kit. You don't have to win first place to win the \$25.00 . . . the highest place with a Berkeley kit gets the cash. Order your BERKELEY kit today so this ready cash can be yours.

NEW!! The "CAVALIER"

**\$1.95
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36-Inch Wingspan—
Rubber Powered. Ball
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M & M Wheels. "Planked" Fuselage

The aristocrat of model airplanes for the first time in rubber power. Employs famous Berkeley Gas Model construction making it practically crash-proof. Kit includes everything to build the model as pictured. All balsa parts are printed out; semi-finished nose block; liberal quantities of cement and dope; and full-size easy-to-follow plans.

CAVALIER "60"

60-Inch Wingspan—For 1/7 h.p.
Motors, Monocoque Construction

Here is a ship that brings a new thrill to the small gas model class. It glides like the "Custom Cavalier" and climbs like a bullet. Lowest-price model ever offered with exclusive Monocoque construction. Install your Ohlsson or Hi-Speed in it and watch real action.

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FOUR FOOT WINGSPAN. Small-bore Champion, spe-
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P.P. The newest "Buccaneer" in this famous line of
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Ohlsson Wheels	M & M Wheels
2 1/2" dia....\$1.25 P.P.	2 1/2" dia....\$.90 P.P.
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FLIGHT DURAL TIMER

Now you can install a "Stop-
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New 1939 Brown "D"
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Precision-made. New and im-
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Special steel cylinder
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These lightweight motors have been designed to our specifications. Every detail of the original radial engine has been accurately reproduced even to the cowls at the front. They are a distinct improvement over other dummy motor. At Whitfield's low price, they can be easily included in every flying model kit.

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stroyed if the rubber should break. Glide the model, correcting any tendency to stall by moving the wing back, or vice versa for too steep a descent. Test fly the ship with about 600 turns, adjusting it to fly in left circles of 35 to 45 feet. Avoid warping the rubber excessively, aiding the turn if necessary by off-setting the thrust line to the left with a tiny sliver of balsa between the nose plug and the fuselage. This combination was used on the original and seemed to work very efficiently. Gradually increase the number of winds till the maximum altitude available is reached. The amount of climb can be regulated by increasing or decreasing the length of the rubber loop or "slack." If flying conditions are poor 7/64" flat rubber with plenty of slack will prove more efficient than thinner rubber with less slack.

In any event this cabin is capable of turning in high enough durations to put a kink in the neck of any modeler if he must watch his ship dodging in and out of the rafters.

Air Ways

(Continued from page 23)

'Soaring,' and 'Gas Model Experiences,' also demonstrations of an Elf motor, a Cavalier gas model and how to make and use microfilm were held.

"To keep our modelers active we have set up a series of qualifying ranks. All members on joining the club become Cadets. To qualify as a Pilot three flights of 1 minute or over for outdoor rubber or gas and 2 minutes or over for indoor rubber is required. To qualify as an Ace one flight of 5 minutes outdoor rubber, 3 minutes outdoor gas, or 10 minutes indoor rubber is required. The title Champion Aeroneer is held by the member with the longest flight in each division. These times may seem too low for the more experienced modelers but they are working out well in our new group.

Our contest calendar calls for one contest per month throughout the year. Three of the contests we plan to make invitation meets. We held our first club contest in the 105th Infantry Armory, March 11. The winners were Baby R.O.G., John Schneider, 1' 46"; H. L. Stick, Jack Thelan, 5' 11"; and H. L. Glider, Lansing Rosekrans, 17". The times aren't too good but none of our group had tried microfilm before two months ago.

"We are making arrangements to affiliate with the N.A.A. There are about fifteen members getting gas memberships now and we're hustling to get the other five so that we can become a Gas Model Chapter."

Texas

Mr. M. M. Valentine, general manager of radio station KPAB at Laredo, Texas, is the vice-president of the Laredo chapter of the N.A.A. He writes us that:

"The first miniature airplane derby here in Laredo got off to a fine start and a decidedly fine finish. It so happened that this meet was running in competition to a professional trick golf meet being held at the Country Club adjacent to the airport at the same time. We are right

happy to say that the airplane derby drew ten cars to every one at the Country Club which, of course, pleased the sponsors of the meet as well as the participants."

Contests

The following contests will be held in the near future:

The All-Iowa Meet will be held on July 30th, sponsored by the Rocketeer Aero Club and directed by Clifton P. Oleson, N.A.A. director for the state of Iowa. Entry blanks may be obtained from Claude D. McCullough, R.R. 5, Ottumwa, Iowa.

On June 17th the Star Model Airplane Association of Delaware will hold a rubber power meet, and on June 24th they will hold a gas model meet. Full information may be obtained from John B. France, Star Publishing Company, Wilmington, Delaware.

Wallace R. Blake of the Marshalltown Junior Chamber of Commerce of Marshalltown, Iowa, announces that the Ace Model Club will hold its fourth annual model meet in Marshalltown, on July 4th. Mr. Blake will send rules and entry blanks upon request.

On June 11th the Playground & Recreation Dept. of the City of Aurora, Illinois, will sponsor an open model contest at Waubonsie Gold Course. Russell A. Perry is director.

Comments

We have received a letter from two young men residing in Detroit, who sign themselves "T.V. and L.D.R." They ask:

"Why don't we hear anything of the planes that have gone out and established international records; such as the Italian Breda B88 which holds five international records, the Italian Savoia-Marchetti S79 which also holds five international records."

1939 YEAR BOOK

- Almost finished when you read this. Hope to have it completed by end of June.
- Can't give you exact Contents List at the moment, but it will have its usual quota of 100 plans or more, and corrected summary of everything we know on Aeromodels.
- Price is still \$1.00. Postpaid. Orders taken now. Pre-publication orders will be cleared on day the book is received from the printer. Over-seas readers: Save time and money by ordering from your distributor. He will have a stock on hand as soon as possible. Complete list published next month.

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YOU and JASCO

- Just a word to let you know that JASCO personnel is going to the Nationals. Temporary staff will ship orders as per routine, but will not restock balsa. Please order your JASCO Quality Supplies at your earliest opportunity.

• This is JASCO's seventh National. During these years many of you have become its steady customers. It was, and still is, a pleasure and a source of pride to the staff to watch your progress on the final score results of meets all over the country. You have justified JASCO's claim that quality supplies are for consistent performance.

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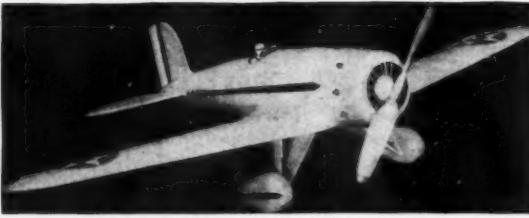
32½" Span. Length 22¾". 1" Scale. Weight 6 oz. Color grey, top wing yellow.

THE MOST EXCLUSIVE AND FINEST EQUIPPED MODEL IN THE WORLD. MOVABLE CONTROLS WORK FROM COCKPIT. A special de luxe model, one of the most beautifully made. Set contains 4½" scale Wright Cyclone celluloid motor, detailed push rods, fins, etc., like real motor, 4½" aluminum cowls, 10" steel type carved prop, 2½" wheels, tail wheel, star nose rudder, insignia and lettering, rubber, windshield, instrument board, flying wires, 4 aluminum step plates, aluminum wing struts, ready cut wheel pants, washers, 3 oz. grey paint, ½ oz. yellow, ½ oz. red, 2 oz. glue, etc. All other parts are printed on balsa wood. 33" x 44" scale drawing. \$4.50
Const. set, complete in labeled box, postpaid.

**NEW SEVERSKY P35 ARMY FIGHTER**

32" Span. Length 25". 1" Scale. Color, Silver

A brand new model of the 1938 Bendix Trophy Winner P 35. Set has 4" turned balsa motor front, 10" carved prop, balsa wheels, tail wheel, rubber, all parts printed on balsa, 3 oz. silver dope, ½ oz. black, 2 oz. glue, etc., insignia, and full size drawing. Const. set in labeled gift box, postpaid. \$3.25

LOCKHEED P23A NAVY FIGHTER**COMBINATION LAND AND SEA PLANE SET**

32" Span. Length 20½". Weight 3½ oz. ¾" Scale

Model will rise from land or water in few feet. Construction set contains fuselage and pontoon formers, wing ribs, tips, etc., printed on balsa, a 3½" turned cowl front, 2 instrument boards, colored insignia, lettering, windshields, 9" carved scale flying prop shown, 3 oz. silver paint, 1 oz. cement, ½ oz. black, 2 oz. glue, ready cut wheel pants, strong 4" aluminum wheels, 12" feet, rubber, and large 33" x 44" drawing of land and sea plane. This is a sensational model and only one of its type in the world. Construction Set in labeled gift box, postpaid.

NEW GAS MODEL
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Motor,
Wheel,
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Prop.

50" Span. Length 38". Weight with motor, 1½ lbs. A real scale gas model with top performance. All parts printed on balsa, set of colored paints, insignia, tail wheel, etc. Model uses small Ohlsson "23" gas motor.

BOEING F4B4 NAVY FIGHTER

22½" Span. Length 14½". 3½" Scale
Set has 3" celluloid motor, 3½" tapered aluminum cowl ring, set of paints, etc. Postpaid. \$2.50

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\$4.95

Postpaid
Less
Motor,
Wheel,
and
Prop.

NEW GAS MODEL
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Motor,
Wheel,
and
Prop.

Set has 3" celluloid motor, 3½" tapered aluminum cowl ring, paints, etc. Postpaid. \$2.75

BOEING P26A ARMY PURSUIT

22" Span. Length 17½". 1½" Scale
Set has 3" celluloid motor, 3½" tapered aluminum cowl ring, paints, etc. Postpaid. \$2.75

NEW GAS MODEL
\$4.95

Postpaid
Less
Motor,
Wheel,
and
Prop.

Set has 3" celluloid motor, 3½" tapered aluminum cowl ring, paints, etc. Postpaid. \$2.75

LOCKHEED ELECTRA EXHIBITION MODEL

22½" Span. Length 14½"; Color Grey, etc.
This is the finest solid exhibition model ever produced. Set contains completely finished balsa fuselage, with cockpit cut out, motor hole cut out and headrest attached; all you have to do is paint it. The wings, tail and rudder are all cut to shape, but have to be sanded to proper curve. A 3" celluloid motor with aluminum motor front, 3½" tank, 3½" turned cowl, a set of chrome plated propeller, 4 cast bombs, 3 celluloid wheels, tail wheel, complete set of colored paints, glue, filler and all other parts with full size drawing. Set, postpaid.

27½" Span, Length 19½", Scale ½"
Plans approved authentic by Lockheed Aircraft Corp. This is a De Luxe model with special equipment. Standard Set No. 1, same as above, includes 2½" celluloid motor, aluminum motor front, two 3½" three-bladed aluminum prop, two 1½" M & M pneumatic air wheels, all parts printed on balsa, set of colored paints, glue, etc. The \$4.50 is the finest transport model made. Set, postpaid.
Standard Set No. 2, same as above without special equipment. Flying \$2.95 model type. Set, postpaid.

NORTHROP A-17 ARMY FIGHTER

24" Span. Length 17". 1½" Scale
Set has 7" prop, turned motor front, wooden wheels and complete set of paints. Postpaid. \$2.80

NEW 20-PAGE CATALOG, beautifully illustrated, with large photos of the world's finest scale models. SEND 10c COIN.

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with a . . .
HOOD VACUUM
FLIGHT TIMER

★ ★ ★ ★ ★

Seconds are precious to your model, stop your motor to the second with this new revolutionary timer. Absolutely foolproof and accurate. Entirely new principle, small, lightweight, easily installed.

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GEARS . . . OIL

Adjustable duration from 1 second to 5 minutes. Durable, reliable, nothing complicated. Will not clog or jam. Protected from dirt and dust. It's the perfect flight timer.

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Please rush prepaid Hood Flight Timer. Enclosed is money order for \$1.25.

Name
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My closest dealer is
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ords and the Italian Cant 506 which is the world's fastest commercial seaplane."

There are several reasons why these machines are not heard from: First, details of these ships are very difficult to get. Second, there are many other ships besides these Italian planes which hold records. Third, all the ships that hold records are not always the best in the particular class, for this reason: The virtues of many American planes and those of other countries are not always advertised and do not always go after records. For instance, there are a number of American ships which can out-fly ships of any other country. This statement is based on knowledge of their actual performance; however military authorities deem it wise to keep such performance secret. The establishing of any record by such craft would immediately make their capacities known to other governments. Obviously for the sake of safety, this is not always desired. Therefore we publish data concerning ships which we know are superior, regardless of how many records other ships may hold.

Making Models

It appears that large scale plane builders are gradually rising to the level of model builders. For many years they have hesitated to build models as they felt that such procedure was beneath their dignity. Now we see that Glenn L. Martin has recently built a comparatively small flying model of his immense patrol bomber. This small model is large enough to carry a man. It is interesting to note that Mr. Martin expresses gratification that the large bomber, when completed, exhibited identical characteristics of the one-quarter scale man-carrying flying model, which was tested in 1937.

Symmetrical Halves

Here is a little hint on how to make symmetrical fuselage halves, sent us by E. T. Robinson. He says:

"When making models I make both fuselage halves at the same time to insure symmetric or perfect identical halves and to save time. First I cut and bend to correct size and shape the four main longerons or body strips. Then placing two strips of approximately the same weight and of required size together, I cut the short strips or body spacer strips to exact size. This will insure two identical pieces of each spacer.

"Pin the top main longerons, one on the other, to the plan with a pin at each spacer station. Then placing each spacer on the other of the same size and putting a spot of cement on ends of each spacer, place them in position on the plans. Be certain that they are in correct position and firmly against the two top longerons. Next pin the two bottom main longerons in place thus holding the spacers securely in position.

"Check position of strips and make sure pins are holding firmly. When the cement sets you will have two perfect symmetrical fuselage halves that can easily be separated by running a double-edge razor blade between the halves at each joint."

Wing Area

There seems to be a little misunderstanding as to what constitutes wing area on fuselage models: Whether or not that part of the wing which lies directly on the fuselage is to be considered wing area has been the question in many boys' minds.

In most of the contests, in the case of high wing ships on which the wings rest directly on the top of the fuselage, the part of the wing on the fuselage is not considered to be wing area. However in this case the center section of the wing may be computed as part of the fuselage cross section. This is only logical.

In order to avoid any discussion or confusion concerning this point we advise young men to build their models so that the wings pass through the fuselage. In such a case the wing area is measured from the point at which the wings enter the fuselage to the wing tips. The wing inside the fuselage is not considered to be wing area.

Magpies Attack Model Planes

ADELAIDE, Australia.—Attacks on planes by magpies are worrying model aeroplane club members. Last week a valuable model and a glider were badly damaged when the birds swooped down on them.

The magpies apparently think model planes are being sent up after their young.

Adjusting Models

Dale Dutt of 910 Lunden Street, Bethlehem, Pa., appears to be in great trouble. He says:

"I have experimented with model airplanes whose prices range from ten cents to one dollar and fifty cents and have no good results. My room is full of sleek, beautiful, well-built models. My friends admire them very much but when they ask me to fly them I feel like a so-called 'dope.' They taxi around very fast, my prop is sand-papered till I can practically see through them, and yet they will not fly. What can I do about it?"

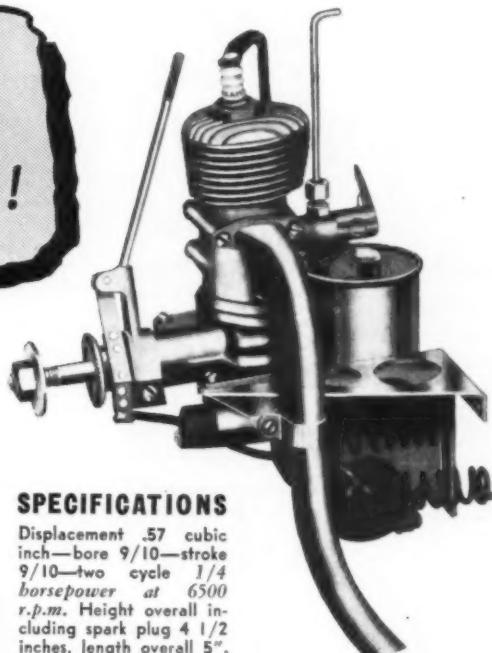
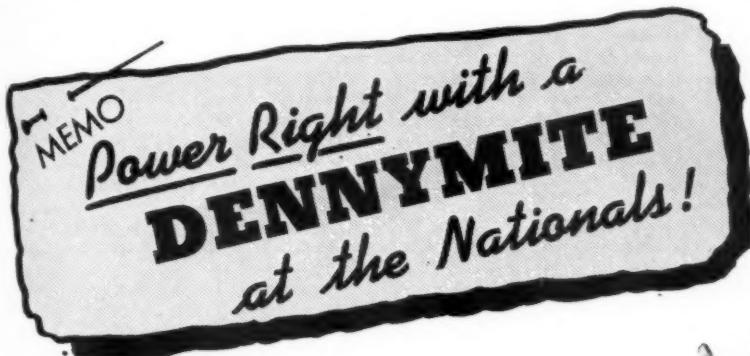
There appears to be some elusive factor that Mr. Dutt is overlooking. We would say that this is the element of adjustment. Apparently the models are built with care and all the parts required for flying are present. The only thing left is the adjusting of these parts, provided they are in their proper places. The arrangement which should produce results is as follows:

The center of gravity should be one-third of the chord length of the wing back of the leading edge of the wing. The chord of the wing should be about three degrees angle to the thrust line. If the wing has a four inch chord, raising the leading edge three-sixteenths of an inch above a line parallel with the thrust and passing through

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Reginald Denny Industries point with pride to the increasing number of Dennymite engines at model meets in all parts of the country.

Have you noticed the big names in the model world that are using Dennymites today? If you will investigate for yourself you will find that the Dennymite will outperform and outwear any other motor in its class.

Dennymites superior INTERNAL DESIGN is the secret of our power and extra oomph! (Dennymite works equally well upright or inverted.)

DE LUXE AIRSTREAM

Complete with coil, condenser, Dural motor mounts, De Luxe long exhaust and exclusive spring choke

\$17.85
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STD. AIRSTREAM AIRSTREAM UNIT

Complete with coil, condenser and short exhaust stack..... Same as Standard Airstream

\$15.85
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\$13.85
postpaid

SPECIFICATIONS

Displacement .57 cubic inch—bore 9/10—stroke 9/10—two cycle 1/4 horsepower at 6500 r.p.m. Height overall including spark plug 4 1/2 inches, length overall 5".

MERCURY MIDGET WINS AGAIN!

Taking 1st, 2nd and 3rd places at Fresno, California, April 23rd, these three separate racing cars all powered with Dennymite engines set a new record for the 16th of a mile track.



Precision Props

Did you know that 14 out of 15 contests held in Cal. last year were won with Precision Props.

9" to 14"	.50c	18"	\$1.25
12"	.65c	20"	1.50
16"	.85c	20"	1.50

MESSAGE TO DEALERS

Are you getting your share of the rapidly increasing interest in model business? Write for new catalogue (just out) with Dennymite details and complete line of model supplies.



MERCURY MIDGET KIT
COMPLETE, postpaid..... **\$19.50**

(Less Motor and Flywheel)
SPECIAL DENNYMITE RACING **\$17.85**
ENGINE, postpaid.....

(Including coil, condenser, fly wheel
and polished aluminum long exhaust)

GREAT PRICE REDUCTION on DENNY RUBBER MODELS!

Thousands of These Rubber Endurance Models Have Been Sold All Over the World.



SKYLARK was 50c

NOW 25c

Wingspan 24 inches

Packed in attractive boxes with generous supply of liquids, detailed plans, instructions and finest grade balsa.



CONDOR was \$1.00

NOW 50c

Wingspan 32 inches



BULLET was \$1.25

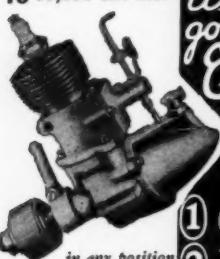
NOW 75c

Wingspan 25 inches

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UP TO 10,000 R.P.M.



it's got Everything

G9

- ① Power
- ② Thrust
- ③ Lift...

plus

FINGER TIP Carburetion
NEW RADICALLY DIFFERENT & IMPROVED PORT SYSTEM

\$10.00

VERTICAL INVERTED HORIZONTAL

In this IMP 'G-9' you own the perfected airplane power plant of tomorrow! It's got everything! Lift, thrust, drive-power to spare! Throttle it down and use it on 40" models or, with slight adjustment, it lifts and flies a 12 pound miniature sky-gram up to 15 ft. (180 Inch) span with standard wing loading. Radically improved port system plus fingertip carburetion are exclusive features of 'G-9'. Unstalling, unfailing performance regardless of mount-position: Vertical, Inverted or horizontal. SPECIFICATIONS: Wt.—bare 9 oz. Bore— $\frac{3}{8}$ ". Stroke—15/16". H.P.—1/5 plus. R.P.M.—from 300 to 7000 (13" prop.) up to 10,000 with flywheel! G-9 will outperform engines selling up to \$20 on a money-back basis. There is none finer made at any price! Complete with coil, condenser & Champion Spark Plug. Mounted on test block.

Here's a Real YOUR MONEY BACK GUARANTEE

G-9 is carefully inspected and tested before shipment. We guarantee, (on mechanical parts) against mechanical or operative defects! You take no risk with the Imp 'G-9'.

NEW LOW PRICE!**Fly-Wate**
CHAMPION COIL

POWER! In tests this amazing midget (wt. $\frac{1}{2}$ lb., 2 $\frac{1}{4}$ oz.) delivered proper ignition to Outboard motor. Quality throughout. A solid basic die casting. High tension wire. Clip & Screw terminal. S.P.E.C.I.A.L. Only

A HOT SPARK Under All Conditions

Especially designed for midget engines! A real achievement in construction and performance! Weighs scant 1 $\frac{1}{2}$ oz. Special

Pervel
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Cement it! Dope it! GRAINLESS! No special or extra ingredients needed! Select from three 24"x36" sheets (at dealers or direct).

ALL BERKELEY Gas Model Kits (up to 8 ft. Wing span) now feature PERVEL! Selected after exhaustive tests!

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FREE CREDIT CHECK

Send 10c (coin or stamps) for illustrated catalog of planes, trains, boats, autos. You will receive a CREDIT COUPON good for 10c cash with any purchase of IMP Products at dealer or direct!

GOOD EVERYWHERE

the trailing edge, will give the wing an angle of incidence of three degrees. The stabilizer should be set at zero or about half degree positive. If the stabilizer is slightly positive, usually the center of gravity may be moved back to a point fifty per cent of the chord from the leading edge of the wing.

We advise Mr. Dutt to concentrate on proper adjustment of his models. He also asks us:

Question: How do you make a slow-moving propeller for a stick model?

Answer: This is carved out the same as any other propeller. If, however, he means "how do you make a propeller move slowly"; this is done simply by making a very large propeller in proportion to the size of the model. A propeller whose diameter is half the wing span is usually a large one.

Question: When will Mr. Grant's book be published?

Answer: This book is expected to be published in the fall of 1939. If you are interested in seeing it let us know.

too late for insertion in our last issue. However we believe it is still worth reading:

"The story behind model airplanes will be dramatized on The World Is Yours program to be broadcast Sunday, May 21, 4:30 to 5:00 p.m., EDST, over the NBC-Red Network.

"Model aircraft clubs are springing up all over the country. From the products of these youthful minds aviation has learned a great deal and will learn much more.

"The World Is Yours, an educational radio feature, is prepared and presented by the Office of Education, U.S. Department of the Interior, the Smithsonian Institution and the National Broadcasting Company."

Lieut. Robert M. Stanley is the official number one entry for the Tenth Annual National Soaring Contest to be held this year from June 24 to July 9, inclusive, at Elmira, (Chemung County) New York.

The American Nautical Academy, National Training School for Merchant Marine Officers, Washington, D.C., announced recently that boys and young men between the ages of 11 and 21 years will be allowed to secure practical ship experience on board a training ship of the Academy within the period from June 1, to October 1, 1939.

The young men may remain on board ship for the entire period, or for any shorter time they may wish, but not for less than a month.

Mr. Leonard J. Dorsey of 317 S. Baylis Street, Baltimore, Md., vice-president of the Baltimore Model Airplane Association, wishes to call attention to the fact that the date of June 4th set for the Baltimore Model Meet has been changed to July 30th.

Mr. J. S. Walker "Oakhurst," Parkgate Avenue, Hadley Wood, Herts, England, would like to have anyone who is interested in autogiro models and has successfully flown this type of ship write to him.

Notices

Many readers wish back issues of MODEL AIRPLANE NEWS. Mr. William B. Scott of Marshalltown, Iowa, has a number which are available.

Mr. Joseph Nieto of 2027 South Hackberry Street, San Antonio, Texas, who is a famous collector of World War photographs and one of our old writers, is now exhibiting his collection at the Research and Curio Center, The Jarrett Museum of World War History at Workman's Dairy Farm, Moorestown, New Jersey.

Fred Otten of East Meadow, New York, R.F.D. 1, wants to know if there are any rubber model clubs in the vicinity of Hempstead, and if so, would any of the members write to him as he is interested in joining.

Further proof of increased interest in models is evidenced by the news release sent us recently. We regret it arrived



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America's Leading
RACE CAR

Engineered for Speed and Durability

TRACK-MASTER

is the latest and best equipped race car on the market. Built from fine materials and precision parts. For any $\frac{1}{2}$ to 1 $\frac{1}{2}$ H.P. motor. Quickly assembled.

SPECIFICATIONS: 13" wheel base, 8" tread. Length over all 19 $\frac{1}{2}$ ". Gear ratio 2 to 1.

Complete kit with
BOSTON BEVEL GEARS
(Less motor and fly wheel)

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Prepaid
Immediate
Delivery

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PACK YOUR SHIP WITH POWER!

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Interested in—



\$975

A \$21.50 Value

SPECIFICATIONS

Displacement .60 cu. in. or 9.9 c.c.—15/16 Bore— $\frac{7}{8}$ Stroke—4 Port—2 Cycle—1/4 Horsepower—Weight Bare 8 oz.

Blue Star Gas Model Plane

THIS PLANE IS A CONTEST WINNER and is perfectly balanced, precision built, and can be assembled by anyone very quickly. It comes with all parts accurately cut, including silk and hardware. The plans and specifications in this kit are full size. It has a 5-foot wing span. The regular price is \$5.00.

Your Price **\$3.65** Postpaid

THE JAMES MOTOR IS PRECISION BUILT AND HAND LAPPED FOR HIGH SPEED. ACTUAL VALUE

\$21.50

NOW

\$975

Postpaid
in U.S.A.

De Luxe Combination

James Motor, Value.....	\$21.50
Blue Star Gas Kit Dry, Value.....	5.00
Balloon Tire Wheels 3 1/2", Value.....	1.50
Accurate Light Weight Flight Timer.....	1.50
Hi-Rev. Precision 13" Prop., Value.....	1.50

Total Value \$31.00

Your Price Complete..... **\$13.85** Postpaid
"Boy! What a deal."

SPECIAL FEATURES OF JAMES MOTORS

Individual pressed-on fins, enables the engine to maintain compression at intense heat and terrific speeds.

Oversize carburation gives the extra gas required for high r.p.m.'s.

Scientifically designed timer gives accurate ignition at all speeds, Mallory points are used on James engines.

One piece counterbalanced and ground crankshaft with force feed lubrication, adds long life and strength by absorbing motor vibration.

Die castings are special aircraft magnesium base aluminum alloy.

HERE'S WHAT JAMES MOTOR ENTHUSIASTS ARE SAYING:

"The James Motor is the third motor I have owned, and I consider it the best regardless of price." Kenneth Straughn, Kimball, Idaho.

"I have completed sales on the six motors purchased from you in February and wish you to ship me three James Motors immediately. We are having good luck with your motors and are well satisfied with their performance." New State Ice and Model Shop, Raymond Bean, Owner, Oklahoma City, Oklahoma.

"You will find enclosed a money order for \$9.75 for one James Motor. I witnessed the incident described by Al Sibley in your advertisement in the June issue of Model Airplane News, and his plane was really going up." Glenn Goodell, Hardin, Montana.

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Only **\$3.65** Postpaid

James Motor

THE GREAT WESTERN
AIRPLANE COMPANY
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CONSTRUCTION SETS

"You'll get a thrill if you catch a thermal!"



K-48 MONOPLANE

48" wing spread—33½" length

This is a monoplane kite that will outfit any model you have ever seen in the air. It's something new that is bound to win popular favor.

Retail 50c mailing charge 20c extra



K-30 MONOPLANE

30" wing spread

20" length

The latest addition to our popular kite models. If you are looking for the thrill of an endurance flight, you should not overlook this number.

Retail at your dealers 25c
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"You'll get a thrill if you catch a thermal!"



K-48 BIPLANE

48" wing spread—33½" length

A big brother to the K-48 monoplane this biplane looks like the real thing! We guarantee that after flying one, you will agree that it has no peer in the air.

Retail \$1 mailing charge 25c extra

NEW GAS TYPE FLYING MODELS (Rubber Powered)



GTI—"CUB" (Illustrated)
Wing spread 36". Overall Length 23½". Weight 2 oz.

GT2—"MERCURY"

Wing spread 36". Overall length 24½". Weight 2 oz. These kits meet the demand for inexpensive rubber-powered flying models that look sound and fly like real gas jobs.

Complete Kits
(No Liquids) Each..... 50c
Mailing charge 15c.

GT3-GIANT 50" ENDURANCE MODEL

Overall Length 37½". Weight 3 oz.

The superior quality and correct aerodynamic design of this model makes it one of the outstanding buys of the season. A dandy flyer!

Complete Kit
(No Liquids) 50c
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New 24" Models

Complete with Liquids

- No. 81 TORPEDO
- No. 82 HORNET
- No. 83 WASP
- No. 84 CYCLONE
- No. 85 INTERCEPTOR
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30" FLYING MODELS



SERIES DK30

101	Kinner Envy	107	Taylor Cub
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103	Stinson SR 8C	109	R. O. G. Scout
104	Bellanca	200	Cessna
105	Aeronca C3	201	Waco Custom
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(NO LIQUIDS)

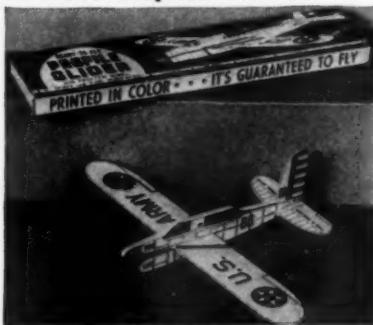
Retail at your dealers 25c
2 for 65c postpaid U.S.A.

2 New 10c Items
1 of Each or 2 Assorted for 30c Postpaid U.S.A.



ARMY PURSUIT
An all Balsa Flying Model Construction Set, colorfully styled with wing, body and rudder printed in red and blue.

Retail at your dealers 10c



ARMY GLIDER
An all Balsa ready-to-fly glider with the profile of a real military plane. Wings, body and elevator printed in red and blue.

Retail at your dealers 10c

Boys!

**WRITE FOR
PARTICULARS
ABOUT OUR
NEW 6 Ft. GAS
MODEL**

IT'S SENSATIONAL!

PAUL K. GUILLOW

• • • • • **WAKEFIELD, MASS.**

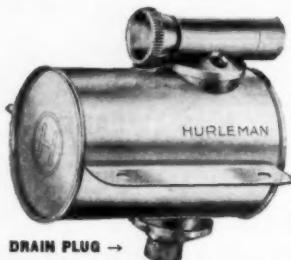


STEP UP SPEED with

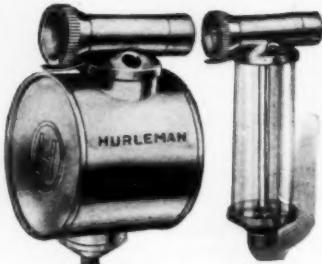
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A size for every need

★ Increased speeds of 1,000 to 1,500 R.P.M. are common with Hurleman Carburetors. These carburetors are made integral with the tank. Easily taken apart for cleaning. Fit all makes of motors. Available in 3 sizes.



HURLEMAN CARBURETOR designed for large bore engines and midget racers. Metal tank, capacity 1 1/4 oz. PRICE \$3.50.



HURLEMAN CARBURETOR with metal tank, 3/4 oz. capacity. Suitable for average size motors. PRICE \$3.00. **HURLEMAN CARBURETOR** with glass tank, 3/4 oz. capacity. Suitable for small motors. PRICE \$2.50.

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Circle H Ignition Coils.....	\$2.50
Aristocrat Ignition Unit.....	\$4.50
Circle H Spark Plugs.....	.75
Replacement Timers.....	\$2.50
Fit all model Brown engines—adaptable to any motor.	
Aristocrat Motor—new model—complete and ready to run.....	\$21.50

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Write for literature—please enclose stamp.
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A Super Streamline Wakefield Model

(Continued from page 19)

wing. Don't forget that these must coincide with the tubes in the center block. In fact, it is best to place those in the wing after those in the center block.

Close up the end of the tubes with a small block of wood, otherwise the wing will fill up with shear pins. Glue the piano wire hook solidly into place. The wing tip is rounded off when glued in place. It should have a nice flowing curve. Perfect alignment should be your motto. Although more difficult, there will be less sag between the ribs if you run the grain of your paper parallel with the ribs. Try it first on an old wing and if you can't succeed after two or three tries, don't insist as it is better to have a bit of sag and no wrinkles.

Tail surfaces: The stabilizer is constructed somewhat on the fashion of an indoor wing. First, enlarge the drawing carefully as you must not have more area than the original. Cut your spars first and then the stab tips. Assemble these and then glue the leading and trailing edges into position. The latter should be momentarily in one piece. Proceed, then, to cut the strips for your ribs. Bend these into place and cut them to length. You will find that they will naturally take the right curve. Then glue them into place.

Fin: The fin, upper and lower, are made in somewhat the same manner and are clearly shown on the plan. Suffice to say that the top portion is glued to a portion of the tail block and is removable. The flap or rudder being mounted on aluminum strips, is adjustable. The lower fin is solidly anchored and glued to the tail block. Note that the leading edge is covered with balsa.

The body: Cut out all the bulkheads which are shown full size. Use 1/8 inch sheet of medium strength. Only the end bulkheads "S" and "B" are cut out of tough 1/4 inch balsa. Having redrawn the body full size, place the upper and lower longeron in place between pins as you

GAS MODEL AIDS!

HEIGHT GAUGE—To check your dihedral accurately and quickly, locate flying surfaces, detect warpage.

PROTRACTOR GAUGE—To set negative or positive incidence of flying surfaces, locate thrust line, etc.

DECORATING PLANS—New color scheme layouts, designed by a qualified artist and model builder. Improve the appearance of your finished plane.

CLUB DECALS—Colorful slide-off transfers to identify your club planes. Easy to apply. Low prices in moderate quantities. Submit your design.

INDIVIDUAL DECALS—Hand-painted emblems for wing tips, rudder, or fuselage. Slide-off transfers attach easily. Brilliant colors.

Please write for circulars

BEEBE PRODUCTS CO.
Box 841 Rockford, Ill.

**Build Aeroplane Models
Quicker-Easier
with this**

MODEL BUILDER'S

TOOL KIT

Now—you may own a complete KIT of 20 MODEL BUILDER'S TOOLS—everything you need to easily build models you will be proud to display. Includes tool for streamlining wings leading edge; tool which strips balsa to desired width; clamp to hold parts together when gluing—not obtainable in stores. Also includes round nosed pliers with wire cutter, tweezers, sharp scissors, square and rule, compass, 5-in-1 hammer with screw driver, drill, counter sinker and center punch, pen razor blade, paint brushes.

Send \$1.98 for complete KIT postpaid (\$3.50 value) or pay postman a \$1.98 plus postage ORDER NOW!

Model Builders Tool Co.
308 Ridgeland,
Elmhurst, Ill.

\$3.50 VALUE
ONLY
\$1.98

THE NEW
MERCURY

GAS MODEL BY SCIENTIFIC
See Page 37

THE FLOYD MIRRO-FILM

The Nationals are almost here, prepare now! Every year many disappointed contestants watch their models slowly sink through weak thermals because they lack the ultimate degree of efficiency that would have resulted in a winning flight. The Floyd Mirro-Film supplies that additional touch.

Even though the Floyd Mirro-Film is being acclaimed for its beauty of finish, the greatest skin improvements are in reduced friction, complete freedom from wrinkles, increased strength, decreased weight, flexibility that eliminates cover-shattering in crack-ups, and so quickly and easily adjustable by heating that a wing warp or bad adjustment is downright excusable.

A 6 ft. gas job with 5 sq. ft. of wing area is covered completely with 3 oz. of Type "B" Mirro-Film. The Floyd Mirro-Film is available in red, orange, yellow, blue, grey, black, and white, in four Types as follows: "A", .19 oz. per sq. ft., "B", .15, "C", .12, "D", .10. Sheets are 24"x36" at 65¢ each, post paid.

Dealers write for discount and information.

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would for an ordinary fuselage. Leave a space of one-thirty-second of an inch between the longerons and the fuselage outline. This is to allow for the balsa covering. Glue in lightly the vertical and slanted braces as shown. These are only temporary.

At this point you should glue all the half-bulkheads into place on one side. Of course the two end bulkheads should be left off as they are in one piece. When dry, take it off the board and glue the other halves on the other side. You may now glue on the end rings. Now you should place the two side longerons in place and adjust the whole skeleton until it is perfectly straight. This is easy as it is evident that the two side longerons will be the same length at that moment. Glue them in place.

Begin the planking with plank "X" on each side, then "Y" and then "Z" (see plate 2). All planking is polished inside and out before placing and is 1/32" plus thick or even 1/20". Notice these planks are about 13/16" wide and are not tapered.

At this point you may take out the temporary bracing as the body will now keep its shape.

The planking is held on with two pins at each bulkhead. After these first six planks are on the others are placed in this manner. Place the following plank against the planking at the portion of the body under the wing. Hold it in place with pins on the two bulkheads, "I" and "I".

Fit the plank and taper as necessary. Do this in stages until you reach the end of the body. Notice the plank will only be tapered on the side being adjusted. When satisfied that the joint is well fitted take the plank off, put glue wherever the planks touch; the bulkheads and also along the seam. Push the plank well into place and fix with pins. Then do the corresponding planking on the other side of the body. Although slower a better job is done when the plank is glued in stages, that is between each bulkhead before proceeding. It is well to scrape off excess glue, from the outside, with a razor blade before it can dry. This prevents ugly spots and even deformation of the planking. Notice the planking gets narrower as you reach the more curved bottom position (see plate 2). Do not forget to place the two false longerons between "I" and "I" on which the dress snaps are attached.

The landing gear attachment tubes should also be in place before covering. Note that most bulkheads are tapered more or less so that the planking lays flat on them. When the bottom has been covered you should carve the block. This takes a bit of work and patience. First you should cut a rectangular block of the necessary size. Then you should slant the sides at 7°30' from the vertical so that the wings, when at proper dihedral, will lay flat against the block. This block should be of light wood. Cut out two ribs of stiff paper and glue them at the proper incidence on each side of the block. This takes care as the symmetrical position and angle of incidence of the wings depend on this. These will serve as a base for carving.

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Note that the proper incidence is had when the point of the leading edge is $\frac{3}{8}$ " higher than the trailing edge. The right wing (seen from the front) should have $\frac{7}{16}$ " incidence. The block should be fitted in place so that it is parallel to the thrust line. The top longeron may be cut to allow placing of the block. When satisfied that the external shape is correct, hollow it. Also place the aluminum shear pin and tubes in place in such a way that position and incidence of each wing is the same as the rib you glued on the block. Incidentally this paper rib protects the wood, so it may stay in place. Also cut the holes through which the elastics and hooks pass. After gluing the center block carefully into place you can complete the planking on the top of the body.

The tail block should be carefully shaped and fitted as shown on the plan. The clips which hold it on the body, as well as all fixtures, should fit snugly.

The landing gear, propeller and wing struts are clearly explained on the plan. The propellers originally used were highly polished and had about ten coats of dope. However we now prefer covering with silk, plus two good coats of dope and polished. The free-wheeler used was of a commercial type and was of a dog-tooth type. This type offers a bit of resistance though.

The thrust bearing block and the quarter-round block around which it pivots are of hard wood, such as mahogany. The spinner fits on by friction fit. The wheels, hollow and cross-grained, have elastic band tires to prevent skidding on a take-off plank. A cross bar was found unnecessary on the landing gear. In fact this model lands perfectly nine out of ten times.

The rear motorhook passes through two layers of $\frac{1}{4}$ " cross-grained balsa. The front half fits into the rear bulkhead, while the rear half fits into the tail block. This hook must be well glued into place.

Assembly: The wings are attached to the body by struts. The shear pins are then placed in the center block. A few elastics are then pulled through and each wing is hooked on and pushed into place. The stabilizer is held on by two elastics hooked onto pins within the tail block. The landing gear holds on by a snug fit. To install the motor, make it in two parts, for instance, two motors of twelve strands, each 51 inches long. Hook both on the rear hook, wind each separately to 100 turns and then put both on the prop hook. They will then entwine and prevent the motor from sagging and unbalancing the plane. After a few flights you will probably have to put in 120 winds. To regulate the plane ask an expert to help you. Don't forget these planes are fast. Naturally if your model is a bit over-weight add on power, probably 28 strands will be plenty. So good luck and try not to lose her. (We've lost two so far!)

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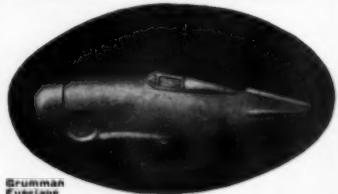
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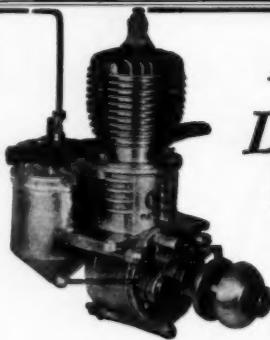
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HERKIMER TOOL & MODEL WORKS

DEPT. F.

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Gas Lines

(Continued from page 25)

Goering of the Douglas Aeroplane factory and was built by Rolf McPherson, son of Aimee Semple McPherson, the Evangelist.

One of the virtues that all model builders must possess is patience. If anyone who undertakes model building does not have this quality it will not be long before he is pursuing a more frivolous hobby. If you do not believe this, we suggest that you look at picture No. 3, in which is shown the completed framework of a Stinson cabin job built by Tech. Sgt. G. P. Gradall of the Ordnance Department, Scott Field, Belleville, Illinois. If you look at the picture carefully you will note that each rib has been built up of small parts. Other details have been carried out with the greatest of care. No one but a careful workman could ever produce a plane like this. The span of the ship is 8 feet and is powered with a Forster motor. As yet it hasn't been flown due to trouble in keeping the needle valve from opening when the engine is running.

This difficulty occurs quite often but it is remedied very easily by placing a small coil spring over the stem of the needle valve between the air intake pipe and the knurled needle valve screw. This spring creates a tension on the screw and prevents it from turning when in flight. At the same time it is easily turned with the fingers when adjustment is required.

Mr. Gradall is now turning his attention to the creation of a radio control plane.

Picture No. 4 shows a simply-built but sleek and racy-looking little model. It was built by O. W. Kopnek of 363 East 71 Street, New York City. You will notice that the body is built up around four stringers which are not carved excessively. A fairing on the top and bottom of the fuselage give an approximately oval section. Thus streamlining is accomplished without complicated structure. The lines of this ship are especially graceful. We know you will not be surprised when we tell you that this model placed first in the Class B Event in the Metropolitan Model League-sponsored contest, held on April 16 at Creedmore, L. I., N. Y. The ship has a span of 48 inches and is powered with an Ohlsson "23." The average time was 4 minutes, 38 seconds and the best flight was 9 minutes on a twenty-second motor run.

Mr. Dudley A. Whitman of S. P. E. House, Gainesville, Florida, was introduced to model building only last fall, yet now he is quite an accomplished builder. He sends us a picture. No. 5, of himself holding his first ship. It is a "Comet Clipper" built last September. In December he built floats for it, with which you see it equipped. He says it is still going strong.

To continue this unusual story, in February he entered it in his first gas model contest and won for the best ship entered! This was judged by picking the best looking three out of all contestants. (There were about 50.) Out of these three the plane having the best time on a thirty-second motor run won the event. Whitman also took seventh place in the Class E Senior Endurance Event. He now is

attending the University of Florida in Gainesville.

Howard Lundquist of 5228 Brookview Avenue South, Minneapolis, Minn., sends us picture No. 6, which shows a new contraption which he has hooked up to one of his motors. It is a new type of gas tank which many of the fliers in Minneapolis are using on their Baby Cyclones. Lundquist says:

"It is made from a celluloid dental floss tube for planes not equipped with timers and from a pen-light case for those with timers. In case your timer sticks your gas is limited to a little better than a minute and a quarter. This tank is fastened to the front bolt of the motor and is parallel to the cylinder. This system has two advantages because of less weight and the motor can be mounted against the firewall and still have positive gas feed in any position."

Robert J. Whittier of 16 Ellis Street, Brockton, Mass., has been working with great diligence on a radio control job, which you see in picture No. 7. He has encountered a little difficulty in starting his engine, though, so flights have been limited to short hops. However he has now made arrangements to give several exhibition flights to a group of newspaper men. We wish him the best of luck.

Vibration is one of the bugbears of model builders. Usually motor mounts and their supporting structure have to be made excessively strong in order to absorb engine vibration without being damaged. It is a well-known fact that the more cylinders an engine has the less the vibration will be in intensity.

Therefore many model builders who understand this fact will be pleased to see the motor shown in picture No. 8. It was built by R. L. Chunn of 2108 12th Avenue North, Nashville, Tennessee. The feature of this engine is that it has alternate firing inline twin. This makes it run much smoother and faster than most engines of this type, due to the balanced explosions and weights of all moving parts. The total displacement of this job is slightly more than half that of the Brown Junior, yet it will swing a 14 inch propeller with an 8 inch pitch nearly as fast as the Brown motor.

Mr. Chunn's hobby is making experimental engines. Last summer he built an engine with a bore of 5/16" by 1/4" stroke and flew a plane with it at the Mississippi Valley Contest, St. Louis, Missouri. To our knowledge this is the smallest engine that has ever been flown. We wish to thank Mr. Richard Tichenor of 1515 Hayes Street, Nashville, for this information. He says he and Mr. Chunn will be glad to hear from anyone who builds model engines and wishes to exchange ideas concerning them.

Jack Schwartz of 1742 North Peach Street, Philadelphia, Pa., who is a member of the Philadelphia Gas Model Association, says that the P.G.M.A. is going strong, with a scheduled gas contest once a month. Instead of having to look for members, he says, they are having their troubles trying to keep down the membership of their club. On one day's notice they can produce 50 planes, ready to fly at any time at any place. This is quite a

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After a year's designing, and a long winter of the severest kind of field testing, we now announce two spectacular new gas-powered models—the COMMANDER and the CADET—models that are destined to smash records right and left. Casting aside all tedious construction work by the introduction of an entirely new fuselage design, and the use of Megow's ready-carved LEADING EDGE, it is possible to produce one of these beautiful models in a few hours. The wings are the strongest ever designed, and are made still more indestructible by detachable mounting. Easy to transport. Realistic cabins.

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Conical monocoque construction of fuselage, expressly designed for quick, easy building. Ready-carved Leading Edge and strongest wing construction ever devised. Clark Y airfoil. Special mounting allows wings to fly off in collision, undamaged. High Aspect Ratio—higher efficiency, better glide and flying qualities. Extremely flat glide puts model into soaring attitude at the slightest favorable air current, and is ideal for landing. Specially designed tail for maximum climbing ability. Skin construction of fuselage permits easy installation of parts. Skid mounting takes any motor.

CADET

Wingspan 51 1/4". Stabilizer span 18 1/2". Wing area 276 sq. in. Uses any 1/8" bore motor. 3 1/2" special rubber wheels. Price. \$3.95 Postage 20c extra.

COMMANDER

Wingspan 6 ft. Stabilizer span 29 1/2". Wing area 570 sq. in. Uses any 1/8" bore motor. 3 1/2" special rubber wheels. Price. \$4.95 Postage 20c extra.

NEW CLASS C. ENDURANCE CONTEST MODEL



Rubber-Powered

Latest type folding propeller increases glide by lowering parasitic drag. Also "free-wheeling" propeller details, furnished for the inexperienced builder. Design based on models flown in contests by two Megow designers and embodying latest developments. Wing streamlined into fuselage. Removable tail simplifies winding. Rubber Tensioner prevents shifting weight of unwinding rubber. Landing gear can be folded for carrying model in box. Wingspan 41". Weight 4.23 oz. Price, \$1.50 plus 15c postage.

Megow's

Send 5c for New Spring and
Summer Catalog of Airplanes,
Ships and Ho-Gauge Model Railroads!

Dept. MA, Howard and Oxford Sts., Philadelphia, Pa.;
or 217 N. Desplaines St., Chicago, Ill., or
Great Western Merc. Co., 718 Mission St., San Francisco, Cal.



feat for any organization.

He claims that now they are testing their planes for the Nationals and are preparing to make an assault on all national records at that contest. (Other model builders take note of this warning!)

Though model builders have undertaken to design, build and fly gas powered autogyros, as yet no successful flight has come to our attention. In light of this fact, Jack Schwartz should be placed in the "first line of new developments" for—lo and behold—you see him in picture No. 9 with his recently completed autogyro. He makes no claim for it so we cannot tell you how it performs. Perhaps this is a dark secret—but we are sure readers

would like to have Mr. Schwartz "open up" and tell something of his interesting ship.

Here is a secret: Jesse Bieberman, the club director, is working seriously on his radio control gas model and it will soon be ready for model flights.

I.G.M.A.A. News Pittsburgh

The Executive Committee of the International Gas Model Airplane Association, Unit One, at a meeting held Monday, April seventeenth, determined to proceed with plans for an active season of gas model flying at the new section of land, leased from the Graham Aviation Corporation, on the north end of the Butler

Reports from everywhere commend the startling performance and ease of operation exclusive with this pioneer of gas powered race cars.

The Speed Demon is the only model car accorded immediate approval of race car drivers and builders.

Quickly assembled from the kit of manufactured parts the Speed Demon with the Speedway engine is the only car to prove entirely practical in thrilling car-to-car racing competition.

The Speed Demon, with its unique gear, has an effect clutch to get her way and reaches a peak speed that surpasses highest expectation.

It's important you get the racer that is proving out in actual competition - the SPEED DEMON automobile powered with the SPEEDWAY engine.

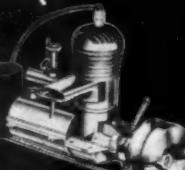


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It's the SPEED DEMON
that's fun to run!

SPEED DEMONS Every one!
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Hollywood, Wherever race
car owners meet SPEED
DEMONS predominate



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Race Car Engine
1/4 H.P. at 8500 R.P.M.

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SPEED DEMON Racer Kit \$1650	
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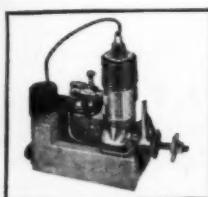


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Free with every supply
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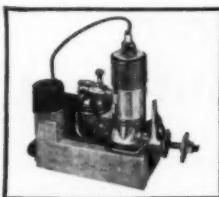
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For 36" lengths, double cut, cost of	18"	1/16 x 12" .05	.020, 100 ft. .30
18" strips per 1000		1/16 x 18" .05	.028, 100 ft. .30
1/16 sq. .08		1/16 x 18" .05	.034, 100 ft. .30
1/16 x 1 1/2" .20		2 1/2" .23	
1/16 x 2" .24		MODEL DRIPS	
1/32 sq. .25		1 Doz. .35	
1/32 x 1 1/2" .25		Small, Doz. .10	
1/32 x 2" .30		Colored, Siz. .50	
1/16 x 3" .30		5" Doz. .38	
1/16 x 4" .30		6" Doz. .40	
9/16 sq. .30		8" Doz. .48	
9/16 x 1 1/2" .30		10" Doz. .50	
9/16 x 2" .30		12" Doz. .55	
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18" Sheets		30" Doz. .100	
Pv. 20		32" Doz. .108	
1/32 x 2" .15		34" Doz. .115	
1/16 x 2" .15		36" Doz. .120	
1/16 x 3" .15		38" Doz. .125	
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1/4 x 4" .25		56" Doz. .170	
1/8 x 2" .25		58" Doz. .175	
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1/8 x 4" .25		62" Doz. .185	
1/4 x 2" .25		64" Doz. .190	
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1/4 x 4" .25		68" Doz. .200	
1/8 x 2" .25		70" Doz. .205	
1/8 x 3" .25		72" Doz. .210	
1/8 x 4" .25		74" Doz. .215	
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1/4 x 4" .25		80" Doz. .230	
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1/8 x 3" .25		84" Doz. .240	
1/8 x 4" .25		86" Doz. .245	
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1/4 x 3" .25		90" Doz. .255	
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1/4 x 2" .25		400" Doz. .999	
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1/4 x 4" .25		404" Doz. .999	
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1/4 x 3" .25		474" Doz. .999	
1/4 x 4" .25		476" Doz. .999	
1/8 x 2" .25		478" Doz. .999	
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MODEL B Special steel cylinder and piston individually fitted make this the last word in precision-made model engines. Cadmium plated. Mounted on skids ready for operation. \$21.50 complete.



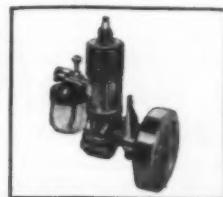
MODEL C Power, durability, and lightweight at a medium price. Block-tested. Aluminum piston and special rings. \$18.50 complete.

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Brown JUNIOR MOTORS

are interested in competing for the journey they should write to Lloyd Owens, 4553 West Othello Street, Seattle, Washington."

Official Eastern States Power Model Airplane Championships

This year's official Eastern States Power Model Airplane Championships will be sponsored by the Metropolitan Model League and MODEL AIRPLANE NEWS Magazine. This meet, the largest power activity in the United States outside of the National Meet, will again be under the direction of Irwin and Nat Polk and Charles H. Grant. The site of the contest has not been definitely decided upon, but will be in or near New York City, on July 29 or August 5.

There will be two events: One for Class A models (models powered by engines of not more than .20 cubic inch displacement and wing area not greater than 225 square inches) and the other for both Class B and Class C models (models being powered with engines having a cubic inch displacement over .20 and not greater than 1.25, and having wing areas over 226 square inches). Each contestant will be allowed two flights in each of the two events. No delayed flights will be permitted. This is necessary due to the large number of entries expected, and will also discourage the flying of untested models in competition.

Models must conform to all N.A.A. rules and all contestants in order to compete must hold N.A.A. power model

licenses.

There will be an entry fee of 50c. Members of the Metropolitan Model League may enter upon payment of a fee of 25c. Applications may be obtained by sending a self-addressed stamped envelope to the Metropolitan Model League at 429 Seventh Avenue, New York City.

Creedmore, N.Y., Invitation Meet

More than 200 entrants from gas model aero clubs throughout the eastern section of the country participated in the events at the first invitation gas model meet sponsored by the Metropolitan Model Airplane Council, which was held at Creedmore, L. I., April 16.

At the close of the day's flying, when the last model had "bit the dust," Mickey De Angelus of the Quaker City Gas Model Club, O. W. Kopnek of the Lucky Devils Club and Henry Wesley of the East Paterson Gas Model Club, were the top prize winners in the three classes; all performances being judged on a basis of average time for three official flights, according to the newly adopted rules of the N.A.A. contest board.

De Angelus averaged 3:38 to win the Class C event, his best time being 8:16. His ship, which has performed very well in many contests throughout the country, featured twin rudders and was powered by a Brown. Second in this event was Jim McPheat of the Queens Aero Model Club, while J. Louis Findra of the Queen City Model Club was third. Paul Banfi of the Metropolitan Model League was fourth



The Famous JIMMIE ALLEN "THUNDERBOLT"

with Automatic Release Bomb Kit

Here's a peachy value—for only \$1.00 (postpaid) you get a complete Jimmie Allen THUNDERBOLT kit, including kit for Automatic Release Bomb (which actually explodes paper caps and can be re-loaded). Both kits sent 100% complete with materials and full-size plans. (Caps not included in Bomb kit.)

20,000 THUNDERBOLTS have been built and flown—so you know it must be good. Has an official contest record of 8 min., 21 2/5 sec. before passing out of sight. Wing span 24", overall length 19". Flying weight 2 oz. or less. Send TODAY for this big, extra-special value.

FREE CATALOGS—Send name, address, dress, and 8-cent stamp for three 1939 catalogs of gasoline and rubber model supplies and kits.

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DIAMOND DEMON

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THE NEW **MERCURY**

GAS MODEL BY SCIENTIFIC
See Page 37

Build—This New—13½ ft.



Covered and Uncovered View of PCC-8

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Two Man Racing and Cruising Model—Fast—Portable
—Length 13½ ft. 30 lbs.—The thing for Week-end
Vacation Trips. Complete Construction Kit containing
all wood parts cut to correct shape, spar varnish, dope,
canvas for covering, paint, plan and instructions, etc.
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Complete Kit—Price.....\$10.00

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SPORTCRAFT KAYAKS
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105 Pearl St.

and Frank Moss of the Kee Wees was fifth. Others in the first ten were Henry Struck of the Queens Aero Model Club, Howard Simmons of the Queen City Model Club, Howard Beitchman and Vincent Salemme of Sky-Scrapers and Mathew Porta of the Metropolitan Model League.

Kopnek had no easy time in winning the Class B event; however a good second flight made up precious seconds to give him an average of 4:33 for three flights with his gull-winged Ohlsson powered craft. Scotty Murray of Sky-Scrapers was well in the lead early in the day, his flight of 9:56 being the best single performance of the contest, and bringing up his time total. However, his flights only gave him an average of 3:56. His ship was unusual in that it featured a Ritz

wing, a single surfaced airfoil of high camber and somewhat on the order of a McBride B7 section. Henry Struck was third in this class with Gus Jung of Sky-Scrapers fourth and Walter Eggert of the Quaker City Gas Model Club, fifth. Others in the first ten in this class were Frank Ehling of the Jersey City Airwheels, Amos Calleson of the Kee Wees, Leon Shulman and Philip Fruchtmann of Sky-Scrapers and Joe Raspante of the Majestic Aero Club.

Wesley was the only contestant in Class A to win a prize, or for that matter to get a single OFFICIAL flight. His best flight was 59 1/2 seconds, and his average for three flights was 57 1/2 seconds. Experts concluded, after the sorry performance of most Class A ships, that either modellers must radically change designs in building ships for this class, or the maximum area rule must be increased by the N.A.A. It was learned that a majority of the builders held that under the present restrictions it was almost impossible to build such a ship and still keep it light enough to fly well.

The meet was conducted by Joe Leghorn, senior advisor of the Kee Wees, under the M.M.A.C. plan to let the member clubs gain experience in conducting meets. Timing was done by appointed members of the Council and by several competent watch holders from the Student Fliers League.

Results were announced and prizes awarded at the Council meeting, April 20, at which time Club scores in the meet were also given. Under a point scoring basis, with ten points for first place, nine for second, etc., the competing clubs stood as follows: Sky-Scrapers, 26; Queens Aero Model Club, 22; Queen City Mod. Club, 17; Quaker City Gas Mod. Club, 16; Kee Wees, 10; Lucky Devils, 10; Metropolitan Model League, 8; Jersey City Airwheels, 5; Majestic Model Club, 1.

LANCER "45" →

Chicago model builder reports 14 min.
5.6 sec. on first flight with his Ohlsson
kit. This plane is known as the Lancer. It
weights only 16 oz. complete due to the
simplified monocoque construction used.
It cuts building time ½ tool.

LENGTH 32" SPAN 45"

Complete kit with air
wheels.....\$2.95pp
With colored dopes and
a finished prop.....\$3.50pp

← THUNDER BIRD "45"

Length 28½" Span 45".
N.J. builder writes
that, "My small Thunder
Bird climbs like a
Rocket."

Complete kit
(less wheels).....\$1.95pp
With air
wheels.....\$2.95
With wheels, colored dopes
and finished
prop.....\$3.50

NEW CYCLONE AIRCRAFT CO. (Dept. A 11)



THE 6' LANCER

Can be powered by
any 1/6 to 1/3 HP
motor. You get
streamline perform-
ance with this
streamlined design.
Complete kit with an
aluminum cowling
(less wheels).....\$4.95pp
With streamlined air
wheels, colored dopes
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The Syncro Ace Special
½ hp. Motor

Complete, ready to run
with coil, condenser,
oil and 14" \$9.95pp
prop or \$7.50 and your old
motor.

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MORE FLYING TIME

.... Prefabricated models designed by experts—quick to build—sure to fly

All **WIT-KIT**s are prefabricated. An ingenious and scientific method of shortening building time and lengthening flying time. Jig-built models are true. **WIT-KIT** models are stronger, fly longer.

Examine This **WIT-KIT**

See what we mean? This is why we say, "Why be old-fashioned? Razor blades are out." Fly more, learn more. Note: In gas models, fuselage sides are built up, and wing parts formed.



DEALERS: Send for prices and merchandising plan

DESIGNERS OF THE AIR-TRACK RADIO LANDING SYSTEM AND OTHER INTERNATIONALLY KNOWN RADIO AND FLYING AIDS

Coming Gas Model Contests San Diego

The San Diego Aeroneers, comprising 87 members, wish to announce that their fourth annual contest will be held on June 25. Elbert J. Weathers of 2720 Poinsettia Drive, San Diego, Calif., writes us something of their plans, saying:

"You will be glad to know that our entire organization has now joined the N.A.A. Gas setup under the new plan and the contest will be strictly under N.A.A. rules with only a couple of minute changes. The writer was the first one in San Diego to join the new setup and receive license, etc., which has served to pave the way. I believe the local group have at last realized, after much preaching on the part of several of us, that the N.A.A. representation for the Coast can only be built up by activity from this end and not from Washington. As far as we know the L. A. area is also now under N.A.A., or plan to do so immediately. The Northwest is well organized ahead of us so it looks like the complete West Coast will be N.A.A. solid inside of the next year. We out here may, however, elect to fly with a minimum of 10 oz. wing loading instead of 8 as in the East, as we are used to 12 oz. competition right along. Such would be a compromise. In flying under a minimum of 10 oz. our activities would still fall under N.A.A. sanction as we are above the 8 oz. minimum. However, the coming San Diego

All engineering and design under direction of

B. Russell (Russ) Shaw, Early Bird, and former chief designer for Wright Brothers.



Contest will be under the 8 oz. rule as an experiment."

Allentown

The Lehigh County Adult Education and Recreation Program of the Works Progress Administration in cooperation with the Lehigh Aeronautical Society will sponsor their third annual tri-state gasoline powered model airplane meet, Sunday, July 30, at the Allentown-Bethlehem Airport, Allentown, Pa.

For entry blanks, field maps and further information, fliers are requested to write to the Contest Committee, Lehigh County Adult Education & Recreation Program, c/o Mr. Frederick F. Waverek, Supervisor, 445 Hamilton Street, Allentown, Pa.

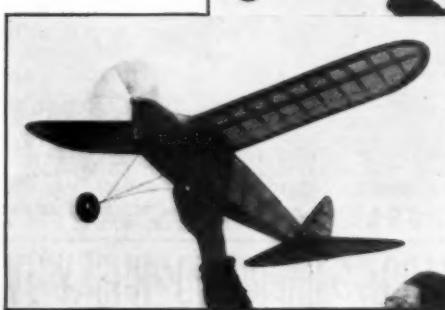
Erie

C. R. Cummins, Secretary of the Tri-County Fair Association of Erie, Pa., writes:

"An exhibit of model airplanes, sponsored by the Exchange Club and supervised by the Gas Model Plane Society, is expected to draw a large list of entries and a great deal of interest the week of August 14-19 at the first annual Tri-County Fair, Erie, Pa."

Plainfield

The Queen City Gas Model Club will hold its second annual gas model contest on Saturday, August 12, at Hadley Airport, South Plainfield, New Jersey. For



ATRIAX What'll you have? A one-wheeled model, stripped for contests, an orthodox two-wheeled model, or an ultra-modern, six-foot tri-cycle landing gear beauty? Build any one with this **WIT-KIT** and get into the air with a sensational gas model that leads the field. Kit, complete, minus motor, propeller and wheels.....\$9.95 P.P.
Airwheels (\$3).....\$3.50

WITEAGLE A 12-ounce, four-foot, wing-span gas model that puts you in fast company at any meet. Jig-built, sturdy, designed for long hours of flashy performance. Kit, complete, minus motor, propeller and wheels.....\$3.95 P.P.
Airwheels (\$2).....\$1.50

Other **WIT-KIT** Models

WITFLY	18"	\$1.00 P.P.
WITRAINER	18"	1.50 P.P.
WITWEEPER	30"	1.95 P.P.
WITBIRD	22"	1.95 P.P.
WITHAWK	32"	2.95 P.P.

Write for folder giving complete information

If your dealer can't supply you order direct

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Make money with your KODAK. Sell your snapshots to publishers of magazines and newspapers. There are over 2000 publications that pay thousands of dollars yearly to KODAK PHOTOGRAPHERS. These publishers pay from \$1.00 to \$10.00 each for all the prints they buy. Booklet gives you 100 publishers who buy photos, the kind and other valuable selling information. Only 25¢ in cost for copy of "THE HUNDRED BEST MARKETS FOR YOUR PHOTOGRAPHS."

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THE BEST ENGINES

On The Market Depend For Their Performance On A

S M I T H Ignition Coil



You too can benefit from their experience by replacing with the genuine article.

New primary terminals, mounting brackets and fibre strap, clip connectors on lacquered High-Tension wire, weight 2 1/2 oz.

Price \$2.50

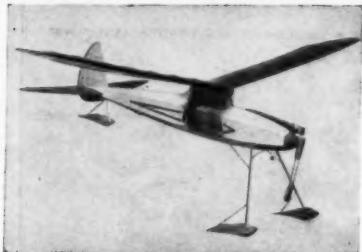
Save weight and win the contest with our NEW Model LIGHTWEIGHT coil.

Beautiful Bakelite case and same high-tension leads as our other coils. WEIGHT 1 1/4 ounces. Price \$3.00.

If you must have a big coil get our 5 ounce BIG SHOT that outperforms all others. \$3.50.

NATHAN R. SMITH MFG. CO.
1814 West 8th St., Los Angeles, Calif.

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Fairchild-24" Now \$1.00

plus 15¢ postage. Same quality (kit less only colored dopes) formerly sold for \$1.95 * %
Scale Span 26 1/2", Length 17 1/2", Wt. 2 oz. The model pictured has made many long stable flights.
Simple to construct and a beauty in appearance and performance.

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COMPLETE KIT \$1.50 post paid



a new two in one endurance model landplane or seaplane FEATURING Hexagon fuselage with shaped sides ★ One blade folding prop. ★ Shock proof landing gear ★ Detachable wing. Fuselage and landing gear ★ Bear claw floats ★ Meets N.A.A. rules. Span 34" — Length 25" — Wt. 2 oz.

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ANNOUNCING! THE NEW 100% IMPROVED "HUSKY" JV.

What do you look for in a motor? It's precision, isn't it? That's essential. Then you probably want a motor with extra power, easy starting, and built to give you long lasting service—The new "Husky" more than meets these requirements. When you buy a "Husky" you can be sure of a square deal—as we guarantee you complete satisfaction.

We have made several new improvements on our latest "Husky"—Special new connecting rod, and crank shaft made stronger—more power produced by change of carburetor intake and ports—auto type timer—and new needle valve with spring lock.

Special Notice! We have been asked by our largest dealers to keep the Husky in class "A" N.A.A. ruling—they claim the "Husky" is the leading motor in this class—displacement, .19 cu. in.—win with a Husky—order yours today.

Specifications. Wt. ready to run 6 oz. with coll. condenser, carburetor, plug and two pencils for current. $\frac{1}{8}$ " Bore, $\frac{1}{8}$ " Stroke—Height 3 $\frac{1}{2}$ ", Length 4 $\frac{1}{2}$ "—Speed 250 R.P.M. up to 8000 R.P.M. using an 11" prop.

HUSKY" JV. MODEL
ORDER YOUR HUSKY TODAY! IMMEDIATE DELIVERY.
Husky motor mounts, wt. $\frac{1}{8}$ oz. per pr., postage 50¢
Husky Non Brittle prop. 11" or 12" each, Post. 75¢ paid

\$12.50

AUGUST ISSUE
MODEL AIRPLANE NEWS
ON SALE JULY 8th



Plane Talk!

Skyway Stocks
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1/16x1/16 60, 56

1/16x1/8 55 for 5c

1/16x1/4 16 for 5c

1/16x1/4 15 for 5c

3/32x3/32 30, 5c

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1/4x1/8 12 for 5c

1/4x1/8 10 for 5c

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1/4x1/4 8 for 5c

1/4x1/4 8 for 5c

1/8" Balsa Sheets

1/4x1/2 6 for 10c

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1/16x2 8 for 10c

3/32x2 7 for 10c

1/4x2 ... 6 for 10c

1/8x2 ... 6 for 10c

1/4x2 ... 2 for 5c

1x1 ... 1 for 5c

1x1 ... 1 for 5c

1x1 ... 1 for 5c

2x2 ... 1 for 5c

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Plastic Balsa

Long shafts—dz.

Lge. Can. 22c

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5 FOOT Balsa

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PROP. BLOCKS

Sheets, 4 times 18"

Double the above

price

aircraft SPURGE

White ... 5c

Colors ... 2 for 15c

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WHEELS per pr.

Balsa Pauli Ritz

Wine Gas

5- 5c 7 Med.

6- 5c 7

7- 6c 12- 9c 20c

8- 7c 12- 10c 20c

9- 8c 13c 20c

10- 9c 22- 15c 20c

11- 10c 28- 13c 20c

12- 10c 28- 13c 20c

13- 12c X- 14- 50c

14- 12c X- 16- 50c

15- 15c- 14- 15- 50c

16- 16c X- 16- 50c

17- 16c X- 18- 100c

18- 16c X- 18- 100c

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138- 16c X- 18-

ACHIEVEMENTS

BUNCH ENGINEERING STAFF

SEA HORNET Speedboat



A racing gas powered step hydroplane speed boat built regular boat fashion. Full size working drawings. Cut out frames, motor beams, keel, etc. Includes rear strut, propeller, drive shaft, stuffing box; also all wood, cement, dope to build as shown.

**Sea Hornet—
post paid \$11.50**

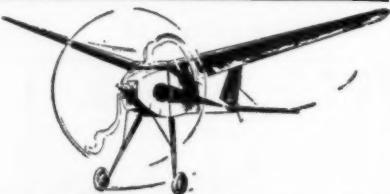
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High performance 57" gas models designed for upright or inverted Bunch 1/5 H. P. engines. Complete with all equipment to build and fly—pneumatic wheels, "Autoknip's" timer, finished prop, covering, cement, dope and all wood and metal parts shaped. The world's top quality gas airplanes.

**Scorpion Senior (Inverted type).....\$10.50
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20" rubber model (postpaid).....\$1.00**



CADET rubber models

World's record Bunch tapered wing duration models complete with all parts to build and fly. Rubber lube, carved prop, freewheel included.

**Cadet Major 30" (postpaid).....\$1.50
Cadet Jr. 20" 50
plus 10c postage**

Special—both Cadets (postpaid).....2.00



**R. O. G. 12" \$.25
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Get the R. O. G.—Starr model building in the footsteps of experts. Easily built and flown. Material for 2 models in each kit.

**Send 10c for new Bunch rubber model catalogue
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BUNCH SPARK COIL



Proven the world's "hottest" Weight only 2 1/2 oz. \$1.50

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simply that hydro gas model flights are now official. This type of gas model flying is strongly recommended to modelers who have available a big, and smooth, water surface from which to operate. Quite a number of gas modelers have reported that this phase of gas model flying has it all over dry flying. R. L. Webber, director for the Chicago Aeronauts, has the distinction of being the first director to receive sanction for a meet of this type, and reports a lot of enthusiasm for gasoline hydro flying in his territory. Mr. Webber and Mr. Harry Bennett, director in Denver, Colorado, have pulled a brand new one out of the bag, which we are pleased to give our hearty endorsement; we quote from Mr. Webber:

"This is a new idea that I trust will be the start of a new conception of contests. The idea back of it is to get better acquainted with flyers in other localities and promote good sportsmanship.

"This contest is to be held on May 7th between the Chicago Aeronauts and an N.A.A. club in Denver, Colorado. Of course neither club will leave the home field. Records will be computed and exchanged between the clubs. The Denver end of the contest will be directed by Harry Bennett, who will apply for a separate sanction. The trophy will be donated by Mr. Bennett and myself and will be called 'The Webber-Bennett Goodwill Traveling Trophy.' It is my hope that the Trophy will travel from one end of the country to the other, and perhaps cause similar events among other clubs.

"It seems to me that at this time all sight has been lost of anything but prizes in contest work. As a result, contests are not well attended unless high prizes are given."

The N.A.A. wishes to congratulate Mr. Webber and Mr. Bennett on their excellent idea, and takes pleasure in giving this type of competition our whole-hearted endorsement.

The complete 1939 rules governing model aeronautics in the United States will be available at the N.A.A. office at Dupont Circle, Washington, D. C., soon. In requesting these rules, send a self addressed stamped envelope or a 5c stamp.

The entire city of Monroe, Michigan, was amazed, and the local N.A.A. Gas Model Chapter pleasantly surprised, when the local newspapers announced the first model airplane show sponsored by Monroe's "Knights of the Dope Bucket" would be held over two days longer than scheduled because of unforeseen popular demand. A conservative estimate of well over two thousand people visited the display of over seventy-five models. Doors were thrown open to the public, and many Monroe modelers responded to an invitation to place their models on display. A full-size "Flying Flea" powered with a Heath B-4 motor was also on display, which, together with several contests, helped to make the show more interesting. The Knights are now planning their first outdoor meet to be held sometime in June.

John Ginetti, Contest Director at Atlantic City, N.J., is one chap who knows how to give the youngsters a run for their money. At a recent indoor meet held in the mammoth municipal Auditorium, Robert Chapman, 16-year-old novice, pulled a major upset by walking off with first place with a

AMAZING DEVELOPMENT

A ONE BATTERY AERO SUPER-COIL

● For the First Time

—A truly ignition engineered product specifically designed to work perfectly on all engines with only one battery. Guaranteed to give as many flights as any two battery coil. Eliminates weight—saves battery cost. Wgt. 2 oz. \$3.00

● A two battery coil which requires no booster batteries. Designed to increase engine power and performance. Wgt. 2 1/2 oz. \$2.75



Prices complete with snap-on high tension leads

Aero ignition condensers..... 20c
14" Hi-tension leads with spark-plug terminals..... 15c

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37-30 81st St. Jackson Heights, L. I.
Obtain Aero coils through your dealer. If he hasn't any in stock, submit order to us and include his name.
DEALERS! Write at once for prices on these new super coils.

\$5.00	
BUCCANEER STD.	
GAS KITS	GAS ENGINES
Comet Clipper..... 4.95	Brown 1/5"..... 21.50
Gordon Eagle..... 2.95	Brown 1/4"..... 0.95
Cavalier Std. 2.95	Synco Special..... 12.50
Courier Sport..... 5.95	Synco Bee..... 12.50
Buccaneer Std. 9.00	...
Super Bee..... 8.50	...
Buccaneer "48"..... 2.95	Forster BB..... 19.50
Airchief..... 6.00	Hillman 1/4"..... 16.50
Commodore..... 6.50	Olivian Goldstar..... 16.50
Miss America..... 7.50	Dennymite Std. 15.85
Red Streamliner..... 4.95	Braun..... 16.50
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Peerless Rocket..... 3.50	
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Quaker Flash..... 4.95	1/8" 225' skein..... .65
Cardinal..... 3.95	3/16" 225' skein..... .95
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Taylor Cub..... 5.50	
MODEL CRAFT	
Gas model props gas to 100 c.c. 25c gas to 200 c.c. 50c	
SEND 5c FOR OUR LATEST CATALOGUE.	
CAPITAL CITY MODEL SHOP	
71 E. Arch St. at Jackson	
St. Paul, Minn.	

Clodette..... 1.00
Clipper Junior..... 1.00
Oriole..... 1.00
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Flyer..... 1.00

Thermalider..... 1.50

Gloster under 21, add 5c
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Order C.O.D. Send
order, 10c deposit
order, 10c deposit
order, 10c deposit

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COMPLETE CATALOGUE.

71 E. Arch St. at Jackson

St. Paul, Minn.

Clothesline..... 1.00

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time of 11 minutes, 52.6 seconds, barely nosing out Ginetti, who came through with a mark of 11 minutes, 52.4 seconds. Merrill Malley, who was favored to win the event, met with some bad luck on his second flight when his plane caught on a light cable and was destroyed in an effort to dislodge it. Nevertheless, Malley's first flight—nine minutes, 3.4 seconds—was good enough to give him third place. Heavy drafts in the Auditorium defeated all record attempts. However, with a report like that, don't be surprised to see Atlantic City on the record listings soon.

Speaking of record listings, none were published this quarter because of the new rules, which automatically voided those marks established before the 1939 rules went into effect on March 15, 1939 . . . don't forget that a new category has been established for gas model hydroplanes . . . an interesting point has come up regarding this class of aircraft as follows: would it or would it not be a good idea to extend the official motor run for gas model hydros in 1940? These ships usually take longer on the take-off, and valuable time is spent in knocking about on the water, instead of going upstairs where the motor run does some good. If you fly gas model hydros, send your opinion to Mr. Edward Roberts, President of the Academy of Model Aeronautics, together with the reasons for your comment.

One of our new contest directors, Mr. Bernard O. Beck of Forestburg, South Dakota, is putting that state on the nation's model map. There must have been a lot of dormant interest in that country, for a unit is rapidly forming and they expect to present a solid, 100% N.A.A. front in a short time. Mr. Beck directed their first official gas model meet on May 14. He has a new and worth-while idea regarding prizes, too. Some of the contestants have all they can do to rake up enough cash to build a ship and install a motor, so a sprinkling of N.A.A. Gas Model Memberships was added to the prize list of the May 14 meet.

We wish at this time to correct a statement made last month to the effect that Bert Pond and Robert Roberts, nominees for the office of State Director, were from Indiana. Just leave Bob with his Hoosiers and shift Bert to the Gopher State (Minnesota, umphay). Our apologies, Bert.

Our consolation prize goes this month to an unnamed sufferer at Hartford, Connecticut. Clifton L. Martin, Hartford Contest Director, tells us that the modeler had finished a brand new gas job, but that it had never been flown. A friend dropped some cigar ashes on it . . . something like the time a visitor tried to light a cigarette in an old shack where the club members were doping their homemade secondary glider.

Schedule of Coming Contests

Harold J. Borger, 509 N. Alleghany St., El Dorado, Kansas.

June 11—Gas and rubber meet at Aurora, Ill. \$100 in prizes. Russell A. Perry, director, 902 Gleason St., Aurora, Illinois.

June 11—Third Annual Gas Meet at Jackson, Mich. \$100 in prizes. Pete Dillon, director, 636 St. Clair Street, Jackson, Michigan.

June 11—Topeka City Meet at Phillip Billard Airport, Topeka, Kansas. Glider,

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SPARK COILS Brown "B" \$3.25

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2 oz. Jar11

PAINT 1 oz.06

1/2 oz.08

1 oz.10

1/2 oz.12

1 oz.15

1/2 oz.18

1 oz.20

1/2 oz.22

1 oz.25

1/2 oz.28

1 oz.30

1/2 oz.32

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1 oz.45

1/2 oz.48

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1/2 oz.52

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1/2 oz.58

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1/2 oz.82

1 oz.85

1/2 oz.88

1 oz.90

1/2 oz.92

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1/2 oz.98

1 oz.100

1/2 oz.102

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1/2 oz.108

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1/2 oz.478

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1/2 oz.482

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1/2 oz.492

1 oz.495

1/2 oz.498

1 oz.500

1/2 oz.502

1 oz.505

1/2 oz.508

1 oz.510



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June 17-18—Gas and rubber Second Annual Northern Indiana Meet. \$221 in cash prizes. Bob Roberts, director, 4490 Broadway, Gary, Indiana.

June 18—Grant County Model Plane Meet at Marion, Indiana. George R. McClure, director, 208 N. Adams St., Marion, Ill.

June 18—Kansas State Rubber Model Meet at El Dorado, Kansas, at the airport. Trophies and Merchandise. Leo Rutledge, director, 302 S. Lorraine, Wichita, Kansas.

June 18—Southwestern Michigan Gas Meet at Lindburgh Field, Kalamazoo, Mich. Medals and Merchandise. L. J. Tooley, director, 330 W. Michigan St., Kalamazoo, Michigan.

June 25—Wakefield and other rubber events at Albany Airport, Albany, N.Y. Cups and merchandise. Albert L. Hurd, director, 17 Steuben St., Albany, N.Y.

How to Make Your Models Behave

(Continued from page 26)

Now we assume that you have made this correction on your plane. If on the next test flight the plane turns excessively to the left but does not have a high degree of banking, you may be fairly certain that your plane has too much fin area. This is easily corrected. Either remove the fin and put on a smaller one or whittle down the size of the fin slightly. Then fly your plane again, provided the other adjustments have been made correctly, and determine whether or not the character of the flight is changed by this procedure.

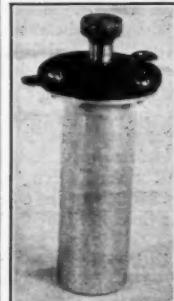
Under these conditions you may expect the plane to turn less sharply to the left, for by cutting away the fin you have created a greater tendency for the plane to turn to the right. In fact if much of the fin is cut away your ship will circle to the right *against* the torque, instead of to the left *with* the torque. In other words, it is possible to control your plane directionally merely by providing the fin with the proper amount of area.

The two methods described here for correcting excessive turning and banking are the only ones that should be used on your plane. Other means of correction, though they may correct these difficulties, will induce other undesirable reactions, the correction of which will defy a magician.

Some model builders have had fair success in correcting excessive turning and banking by off-setting the propeller and rudder. This is done by turning the axis of the propeller about two or three degrees to the right and setting the rudder slightly to the right. This induces a tendency to turn the plane to the right when it is under power, which tendency balances the torque which is turning the plane to the left. Thus the plane flies straight under power or makes wide circles to the left instead of tight spirals. However, when the plane starts to glide, the setting of the rudder turned to the right causes the ship to spiral to the right, usually quite sharply, unless great care

AUSTIN 5/8 OZ. FLIGHT TIMER

Only \$1.25



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DURAL BATTERY BOXES: Now, in three sizes. Hold two cells in series. Batteries may be replaced without soldering. 5/8 oz. light weight. .40c ea.

Penlight and 1 1/2" diam. sizes. Large 1 1/4" diam. size. .50c ea.

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Gives a very broad adjustment and in many cases will increase the power. Easy to install. Needles and tools complete. .40c ea.

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has been taken in the adjustment of the plane. Too sharp a right turn on the glide indicates over-correction. In other words, the propeller axis and the rudder are turned too much to the right.

Unless you are an expert and understand the many fine points in adjusting your model, we recommend that you do not use this latter method, but correct any left-turning tendency by the method suggested in the first place.

If it has been necessary for you to cut down the fin area to a very small amount in order to reduce the turning tendency of your model a tendency to spin may develop. This is due to the fact that too small a fin usually induces this characteristic. Under such conditions, apparently the model builder is up against a stone wall, so to speak. In order to correct one evil, he has produced another. Nevertheless, there is a way out of this difficulty, as such a situation merely means that the plane has too little dihedral, and if sufficient dihedral existed in the first place it would not have been necessary to reduce the size of the fin below the danger limit. Thus you see that there is another way in which turning may be reduced provided you do not wish to cut down the area of your fin. It is not advised to use this method unless it is absolutely necessary, for excessive dihedral reduces the efficiency of your plane. A dihedral of one inch per foot of span is the maximum which should be used unless you wish to sacrifice the model's flying qualities. In the first place, if you have this amount of

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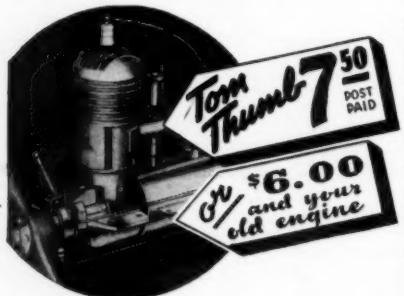
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dihedral then the only alternative is to cut down the fin area. However, if the plane turns excessively to the left and the dihedral is less than this amount, the turning tendency may be reduced by increasing the dihedral rather than by trimming down the fin to a smaller area.

Summarizing briefly: In order to correct spinning which has been induced by cutting away the fin, increase the dihedral and the fin area proportionately. Thus the increased fin area will reduce the spinning tendency while the increased dihedral will compensate for the added fin area in respect to the turning tendency.

Some models, though, are so critical in their adjustments that it is very difficult to obtain the proper balance. In such cases no matter what adjustment you make one of them is liable to be out slightly and cause trouble. Such models have been designed improperly in the first place. There are one or two cure-alls for such conditions. First, the stabilizer should be enlarged. In all models except gas models the area of the stabilizer should be equal to at least one-third of the wing area. In gas models, if the area is 25% of the wing area, the flight of the model should be satisfactory.

In many models, such as stick models, where the propeller is located a considerable distance in front of the wing, it may be necessary to make the stabilizer as large as 45% of the wing area. At any rate, excessively large stabilizers usually give exceptional stability to all models. In most cases it is possible to make a model fly with a reasonable degree of stability and control even though it may be out of adjustment in most every respect. In such planes, any particular adjustment has less effect than in the case of models in which are incorporated stabilizers of small area. In any plane, the smaller the tail surfaces are the more critical the flight adjustments will be.

The second cure-all is termed "down thrust." What is usually known as "down thrust" consists of a dipped axis of thrust. In other words, if you wish to give the ship "down thrust" turn the propeller axis downward at the nose so that it is at a negative angle to its original position. An angle of about minus two degrees is usually sufficient to correct any troubles. In fact the general rule is—if your plane does not perform properly "give it down thrust." This procedure often cures the ills of many improperly designed and obstinate models.

If by chance any one of these "cures" does not correct your difficulties but instead your model persists in executing unfathomable gyrations, the author suggests that you gently but firmly reduce your craft to kindling wood. Perhaps this suggestion will not be necessary; for by this time, judging from past experience, the model builder has taken this step without being prompted. After this, he has only one recourse and that is to start all over again and to build his model step by step following the principles of good design systematically and with the utmost care. Beginners should not be discouraged if their first plane does not fly according to their expectations, as usually this is a very rare occurrence. Anything worthwhile requires a little study and

CLASSIFIED DIRECTORY

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patience in order that it may be mastered, and the art of model airplane building is no exception to the rule. In order to insure the greatest amount of success at the start, it is suggested that you choose to build a plane of simple design. This will eliminate complications and possibly many discouraging moments.

Many potentially fine model builders have been turned away from this art by discouragement merely because, when they were in the beginner's stage, their first attempt at model-building was a failure.

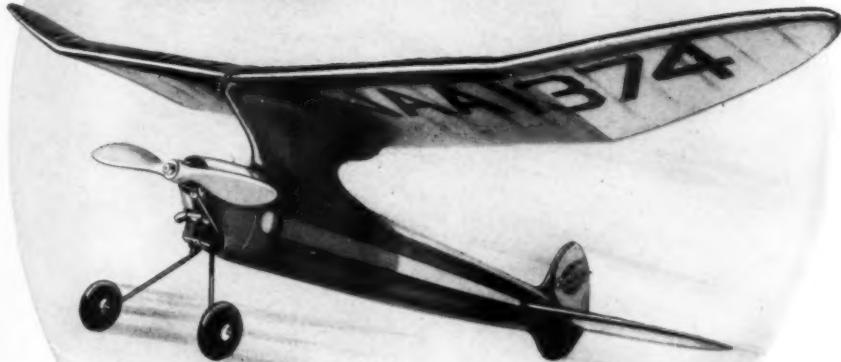
Thus, it is hoped that you will have the wisdom to start your model career by designing and building a simple plane, and if you fail on your first few attempts, that you have the patience to endure and eventually reap the success and benefits that this remarkable sport provides.

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of the



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What a climb!
2,000 ft. per MIN!



CARL GOLDBERG,
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resented to a startled world
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The Comet Mercury is
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Equally outstanding in
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attractive in specifica-
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KIT NO. T11
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MORE FEATURES than you've ever seen packed into a gas model—FEATURES that create new standards of performance—FEATURES proved by hundreds of test flights! The ZIPPER'S breathtaking climb and floating glide will thrill and amaze you! And look at this partial list of contents: FINISHED RITZ PROPELLER— aerodynamically efficient. FINISHED ALUMINUM MOTOR MOUNTS—fit all motors. READY FINISHED PLYWOOD FIREWALL and front ring. WING AND ELEVATOR RIBS accurately cut. WING AND ELEVATOR SPARS tapered. STREAMLINED BALSA WHEELS. READY-FORMED LANDING GEAR. COMPLETELY FINISHED MOTOR LOCK FITTINGS. Plenty of COLORED BAMBOO PAPER, CEMENT and DOPE; dressey ZIPPER decal. All Necessary Hardware. Full Size Plans.

Specifications of the COMET ZIPPER

Wingspan, 54"; Overall Length, 34½"; Wing Area, 3.44 sq. ft. (495 sq. in.); Total Weight (with motor), 30 oz.; Wing Loading, 8.7 oz. per sq. ft.; Wing Airfoil Goldberg G5; Power Plant, Any 1/5 or 1/6 h.p.; Climb, 2000 ft. per minute.

A folder, "How to Adjust and Fly the Zipper and Mercury" by Carl Goldberg, free with each kit.

\$3.95

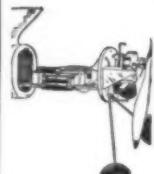
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NEW ADDRESS: 129 W. 29th St., CHICAGO. Dept. MN7. Eastern Branch: 688 Broadway, NEW YORK

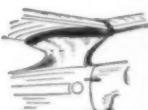
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NO WONDER IT
WINS CONTEST
AFTER CONTEST!

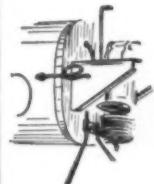
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and Battery Track—
At the slightest suspicion of ignition trouble, you can instantly detach the motor unit and battery track, and inspect closely every inch of wiring, and every possible source of trouble.



"Automatic Pilot" Wing Mount—Hundreds of flights have proved it makes models so stable, so much easier to fly, that it's like having an automatic pilot in your ship!



Motor Locks Hold Motor—Why didn't somebody think of this before? They hold with absolute firmness, detach instantly, safeguard motor in hard landings, and never need replacement.



Shock-proof Wing and Tail—One of the greatest developments in Gas Model history! The Goldberg method of mounting wing and tail allows them to fly off undamaged in event of a hard collision, and thus lightens the stress on the fuselage.



Kit Completeness—So many finished parts that building time is cut down tremendously. Absolutely the most complete kit in its class.

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Because of the undying popularity of the Comet Clipper, it has now been revised—a new 1939 Clipper—incorporating all the latest, approved ideas in gas model construction. For example:

ALUMINUM MOTOR MOUNTS—IMPROVED, DETACHABLE MOTOR UNIT—IMPROVED, DESIGNED IGNITION TRACK—IMPROVED, STURDY WING WITH POLYHEDRAL—NEW, CLEAN-CUT FUSELAGE—FINISHED RITZ PROPELLER—COLOR ED BAMBOO PAPER.

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**the Four Features that mean
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Ohlsson 23 gives you MORE HORSE-POWER than any small bore motor up to and including engines of .30 cu. in. displacement

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Ohlsson 23 has OUTPERFORMED motors of every class and size—taken first place in every important meet, coast to coast. Swing-ing a 10" prop, it will exceed 7500 r.p.m., developing over 2 lbs. static thrust!

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